

INDEX OF SHEETS

NO.	DESCRIPTION	SHEET NAME
1	TITLE SHEET	GN-01
2	KEY MAP SHEET	KS-01
3	EXISTING CONDITIONS	EX-01
4	EXISTING CONDITIONS	EX-02
5	EXISTING CONDITIONS	EX-03
6	EXISTING CONDITIONS	EX-04
7	TREE INVENTORY	TI-01
8	GEOMETRY SHEET	GS-01
9	STREAM RESTORATION PLAN	SR-01
10	STREAM RESTORATION PLAN	SR-02
11	STREAM RESTORATION PLAN	SR-03
12	STREAM RESTORATION PLAN	SR-04
13	STREAM RESTORATION DETAILS	DE-01
14	STREAM RESTORATION DETAILS	DE-02
15	STREAM RESTORATION DETAILS	DE-03
16	STREAM RESTORATION DETAILS	DE-04
17	STREAM PROFILE	PR-01
18	STREAM PROFILE	PR-02
19	TYPICAL SECTIONS	TS-01
20	STREAM CROSS SECTIONS	XS-01
21	STREAM CROSS SECTIONS	XS-02
22	STREAM CROSS SECTIONS	XS-03
23	DRAINAGE AREA MAP	DA-01
24	SEQUENCE OF CONSTRUCTION	SC-01
25	EROSION AND SEDIMENT CONTROL NOTES	EN-01
26	EROSION AND SEDIMENT CONTROL NOTES	EN-02
27	EROSION AND SEDIMENT CONTROL PLANS	ES-01
28	EROSION AND SEDIMENT CONTROL PLANS	ES-02
29	EROSION AND SEDIMENT CONTROL PLANS	ES-03
30	EROSION AND SEDIMENT CONTROL PLANS	ES-04
31	EROSION AND SEDIMENT CONTROL DETAILS	ED-01

PROJECT SUMMARY

TOTAL LENGTH OF STREAM RESTORED: 1,950 LINEAR FEET
STREAM USE CLASS: III
STREAM CLOSURE PERIOD: October 1" - April 20"
LOAD REDUCTIONS AND 1A CREDIT SUMMARY:

1A CREDIT	TSS REDUCTION	TN REDUCTION	TP REDUCTION
43.8 AC	271 TONS/YR	522 LBS/YR	78 LBS/YR

NOTE: CREDIT 1 CALCULATED VIA PROTOCOL 1 BANC'S METHODOLOGY, PROTOCOL 5 OUTFALL STABILIZATION AND THE 2020 MDE WASTEWATER ALLOCATIONS DOCUMENT.

DEVELOPER'S/LANDOWNER'S CERTIFICATION

I/WE CERTIFY THAT ALL PROPOSED WORK SHOWN ON THESE CONSTRUCTION DRAWING(S) WILL BE ACCOMPLISHED PURSUANT TO THESE PLANS. I/WE ALSO UNDERSTAND THAT IT IS MY/OUR RESPONSIBILITY TO HAVE THE CONSTRUCTION SUPERVISED AND CERTIFIED, INCLUDING THE SUBMITTAL OF "AS-BUILT" PLANS WITHIN 30 DAYS OF COMPLETION, BY A REGISTERED PROFESSIONAL ENGINEER.

SIGNED _____ DATE _____

PRINTED NAME _____

ENGINEER'S CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED BY ME, OR UNDER MY SUPERVISION, AND MEETS THE MINIMUM STANDARDS OF THE HARFORD COUNTY DEPARTMENT OF PUBLIC WORKS AND/OR THE UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, AND/OR THE MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION.

ENGINEER'S SIGNATURE _____ DATE _____

PRINTED NAME _____ MD PE REGISTRATION NO. _____

Owner:

HARFORD COUNTY
212 SOUTH BOND STREET
1ST FLOOR
BEL AIR, MD 21014

Prepared By :



P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

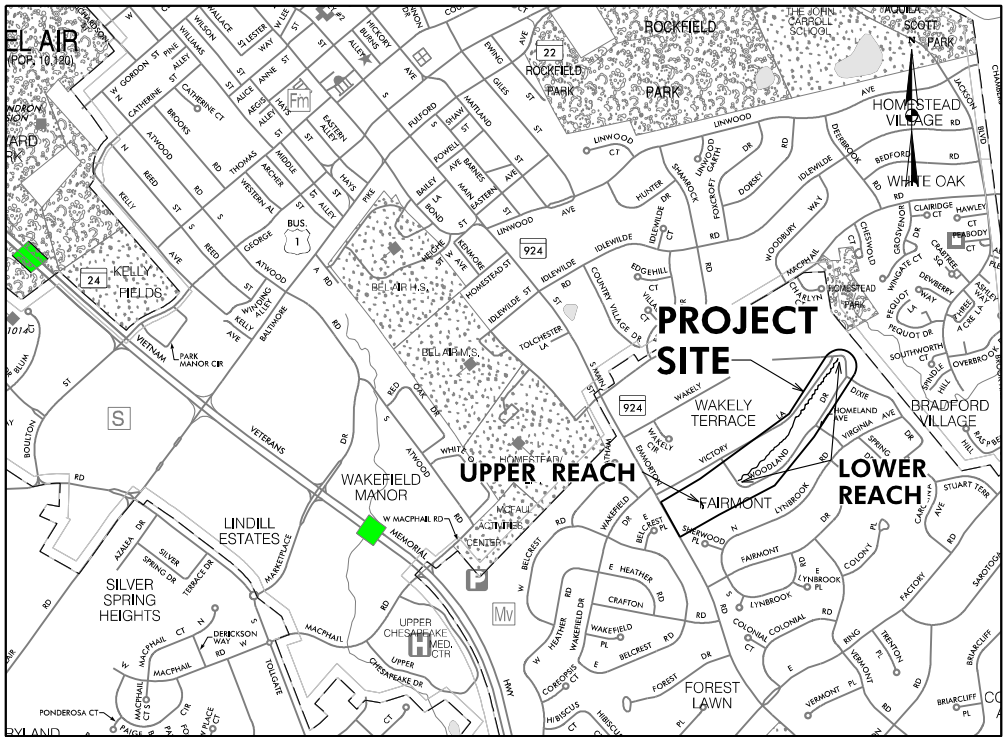
Responsive People | Creative Solutions

WOODLAND RUN
STREAM RESTORATION

75% DESIGN DEVELOPMENT

AUGUST 2021

BID NO. XXXXX
WATERSHED PROTECTION
AND RESTORATION OFFICE
HARFORD COUNTY, MARYLAND



LOCATION MAP

SCALE 1" = 1,000'

GENERAL NOTES

- SPECIFICATIONS: ALL WORK IS TO BE PERFORMED IN ACCORDANCE MARYLAND STATE HIGHWAY ADMINISTRATIONS STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS DATED JULY 2020 AND THE MOST RECENT REVISIONS THEREOF AND ADDITIONS THERETO.
- UTILITIES: UTILITY LOCATIONS SHOWN ON THE PLANS ARE BASED ON LIMITED INFORMATION AVAILABLE. HOWEVER, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE ACCURACY OF THIS INFORMATION. THE COST OF REPAIR OR REPLACEMENT OF ANY SUCH FACILITIES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE BORNE BY HIM.

CONTACT "MISS UTILITY" PHONE 1-800-257-7777. 48 HOURS PRIOR TO THE START OF WORK, THERE SHOULD BE NO EXCAVATION UNTIL THE LOCATIONS OF UNDERGROUND UTILITIES HAVE BEEN DETERMINED.

- STANDARD DETAILS: REFERENCE MADE TO STANDARDS ARE TAKEN FROM THE HARFORD COUNTY ROAD CODE "BOOK OF STANDARD DETAILS" AND FROM "THE MARYLAND STATE HIGHWAY ADMINISTRATION'S BOOK OF STANDARDS-HIGHWAY AND INCIDENTAL STRUCTURES". IT WILL BE THE CONTRACTOR'S RESPONSIBILITY THAT THE STANDARD DRAWINGS IN HIS POSSESSION ARE THE LATEST REVISED STANDARDS UP TO AND INCLUDING THE DATE OF THE ADVERTISEMENT OF THIS CONTRACT.

- RIGHT-OF-WAY LINES: RIGHT-OF-WAY LINES SHOWN ON THESE PLANS DO NOT INCLUDE EASEMENTS. THEY ARE FOR ASSISTANCE IN INTERPRETING THE PLANS ONLY. THESE LINES DO NOT REPRESENT THE OFFICIAL PROPERTY ACQUISITION LINES. FOR OFFICIAL FEE RIGHT-OF-WAY AND EASEMENT INFORMATION, SEE THE APPROPRIATE RIGHT-OF-WAY PLATS.

- SOIL CONSERVATION: THE CONTRACTOR SHALL NOT DISTURB THE EXISTING VEGETATION OUTSIDE THE LIMITS OF DISTURBANCE. STOCKPILING AND STAGING WILL NOT BE ALLOWED ON SITE. THE CONTRACTOR MUST SECURE AN OFF-SITE AREA AND ANY NECESSARY PERMITS. SOIL STABILIZATION WILL CONFORM TO 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. THE CONTRACTOR WILL OBTAIN APPROVAL OF THE HARFORD COUNTY SOIL CONSERVATION DISTRICT FOR HIS PLANS IN CONTROLLING SEDIMENT EROSION FOR THE BORROW AREA AND DISPOSING OF ANY WASTE EXCAVATION.

- EXISTING MAILBOXES AND EXISTING SIGNS: ALL EXISTING MAILBOXES, SIGNS AND PAPER BOXES DISTURBED DURING CONSTRUCTION SHALL BE TEMPORARILY RESET IMMEDIATELY AND PERMANENTLY RESET AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE INCIDENTAL TO ALL OTHER ITEMS IN THE CONTRACT.

- SURVEYS:
HORIZONTAL CONTROL - COORDINATES SHOWN ON THE PLANS ARE BASED ON NAD83(2011) PER LEICA SMARTNET US SURVEY FEET.

VERTICAL CONTROL - ELEVATIONS SHOWN ON THE PLANS ARE BASED ON NAVD88 (GEOID12A) AS PER LEICA SMARTNET.

ONLY THOSE CONTROL POINTS SHOWN ON THESE PLANS ARE TO BE USED FOR THE CONSTRUCTION OF THIS PROJECT.

FIELD VERIFICATION

I HEREBY CERTIFY THAT I COMPLETED A FIELD VERIFICATION TO THE INFORMATION SHOWN ON THE PLANS ON JUNE 15, 2021 AND THAT THE INFORMATION SHOWN ON THE PLANS IS IN AGREEMENT WITH THE ACTUAL FIELD CONDITIONS.

PRINTED NAME _____

SIGNED _____ DATE _____

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE 'AS-BUILT' PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.

ENGINEER'S SIGNATURE _____ DATE _____

PRINTED NAME _____ MD PE REGISTRATION NO. _____

HARFORD COUNTY, MARYLAND

WOODLAND RUN
STREAM RESTORATION

Drawn By : RMO/BEA

Scale : NOT TO SCALE

Designed By : RMO/BEA

Date : AUGUST 2021

Reviewed By : DMH

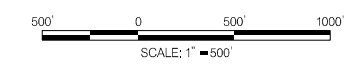
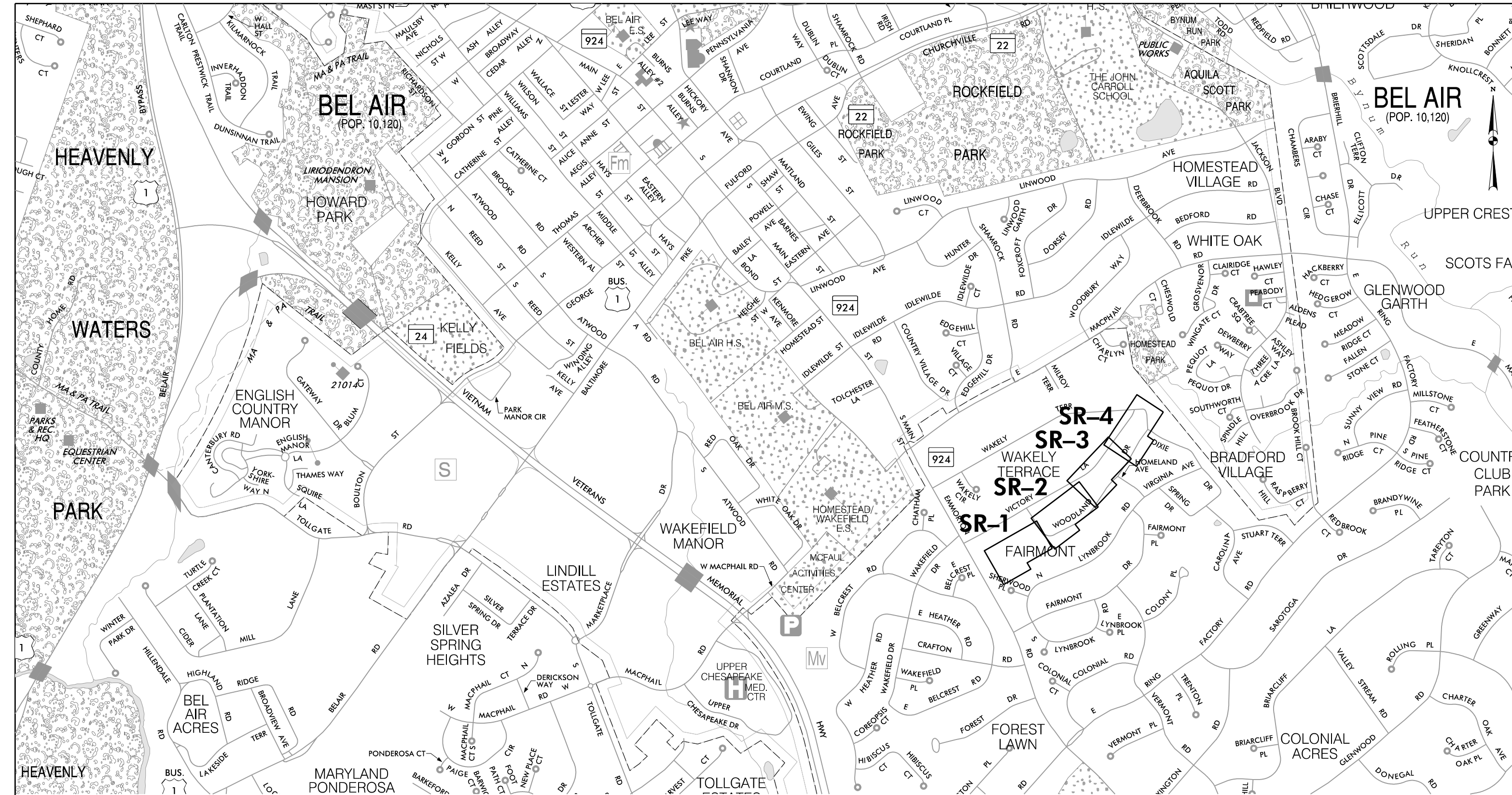
Contract No.: XX-XXXX

Drawing No. GN-01 of GN-01

Sheet No. 01 of 31

BILLING NO. XXXXXX
EG-SWMENG- XXXXXX-XXXX #XXXX
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

S/C PLAN # XXXXX	Revisions
GP # XXXXX-XXXX	
SIGN AND SEAL	



HARFORD COUNTY, MARYLAND

Revisions		WOODLAND RUN STREAM RESTORATION KEY SHEET	
Drawn By :	RMO/BEA	Scale :	1" = 500'
Designed By :	RMO/BEA	Date :	AUGUST 2021
Reviewed By :	DMH	Contract No.:	XX-XXXX
Drawing No.	KS-01 of KS-01	Sheet No.	02 of 31

NOT FOR CONSTRUCTION

RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists
www.rk.com

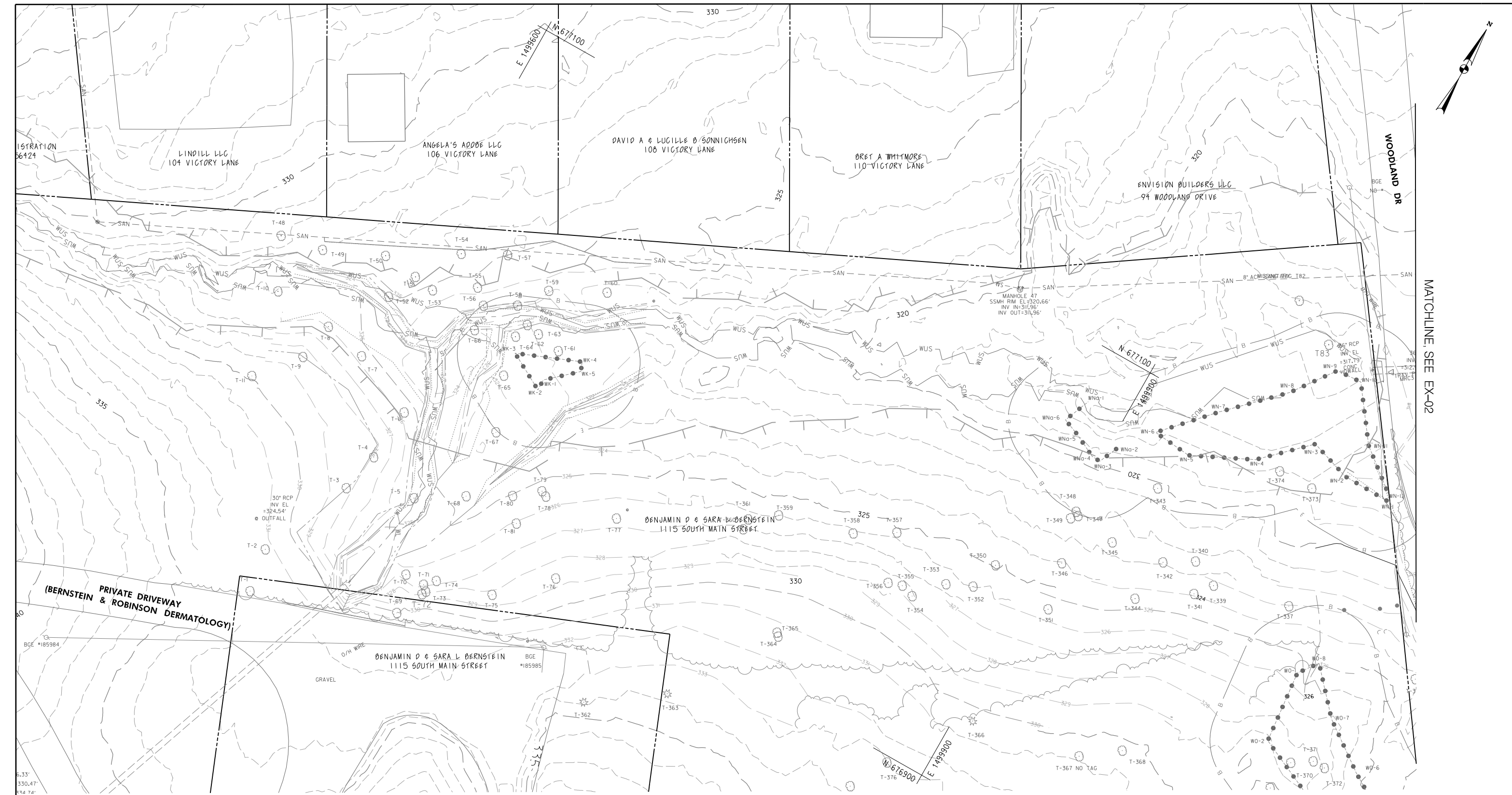
Responsive People | Creative Solutions

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

SIGN AND SEAL

BY: roaks -



BY: roaks -

PLOTTED: 8/15/2021
FILE: \\bakerv05\2017\2017\17040_HARCOITask 001_Woodland Run\CADD\plans\05_pEX-0001-Woodland.dgn

LEGEND

- SAN — EXISTING SANITARY SEWER
- • • WETLAND BOUNDARY
- B — 25 FT WETLAND BUFFER
- WUS — WATERS OF THE US
- EXISTING 100 YEAR FLOODPLAIN
- ROW/PROPERTY BOUNDARY
- 320 — EXISTING MAJOR CONTOUR
- 321 — EXISTING MINOR CONTOUR

NOT FOR CONSTRUCTION

RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

PROFESSIONAL CERTIFICATION

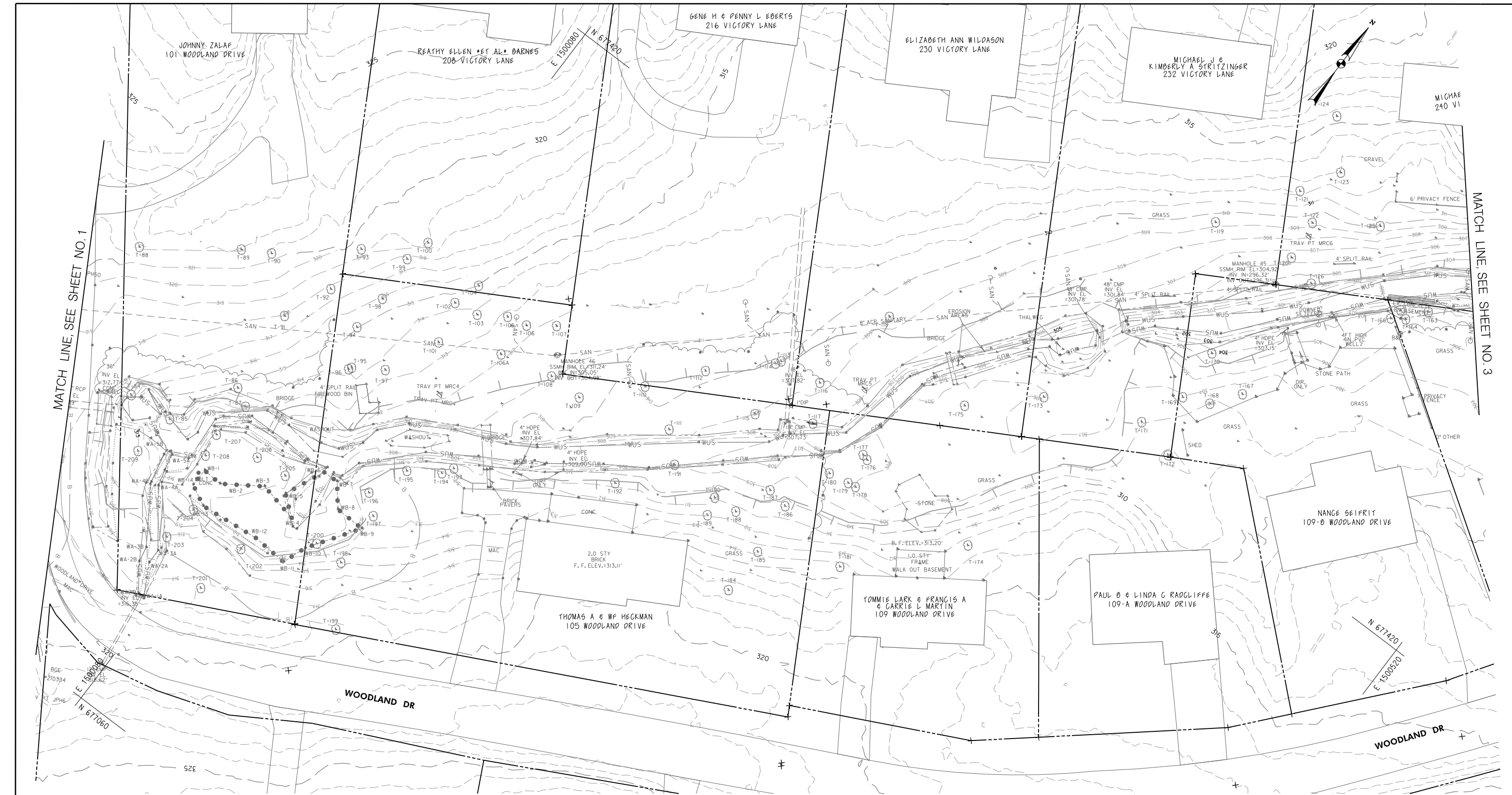
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME,
AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF
THE STATE OF MARYLAND. LICENSE NO. XXXXX. EXPIRATION DATE: XX/XX/XXXX.

SIGN AND SEAL

20' 0 20' 40'
SCALE: 1" = 20'

Revisions	

HARFORD COUNTY, MARYLAND	
WOODLAND RUN STREAM RESTORATION EXISTING CONDITIONS PLAN	
Drawn By : <u> RMO/BEA </u>	Scale : <u> 1" = 20' </u>
Designed By : <u> RMO/BEA </u>	Date : <u> AUGUST 2021 </u>
Reviewed By : <u> DMH </u>	Contract No.: <u> XX-XXXX </u>
Drawing No. <u> EX-01 </u> of <u> EX-04 </u>	Sheet No. <u> 03 </u> of <u> 31 </u>



BY: roaks -

PLOTTED: 9/15/2021
FILE: \\bakr\05\2017\201711\7040_HARCO\Task 01_Woodland Run\CADD\plans\04_pEX-002-Woodland.dgn

LEGEND

- SAN --- EXISTING SANITARY SEWER
- • • WETLAND BOUNDARY
- B — 25 FT WETLAND BUFFER
- WUS — WATERS OF THE US
- EXISTING 100 YEAR FLOODPLAIN
- ROW/PROPERTY BOUNDARY
- 320 — EXISTING MAJOR CONTOUR
- 321 — EXISTING MINOR CONTOUR

NOT FOR CONSTRUCTION

RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

SIGN AND SEAL

20' 0 20' 40'

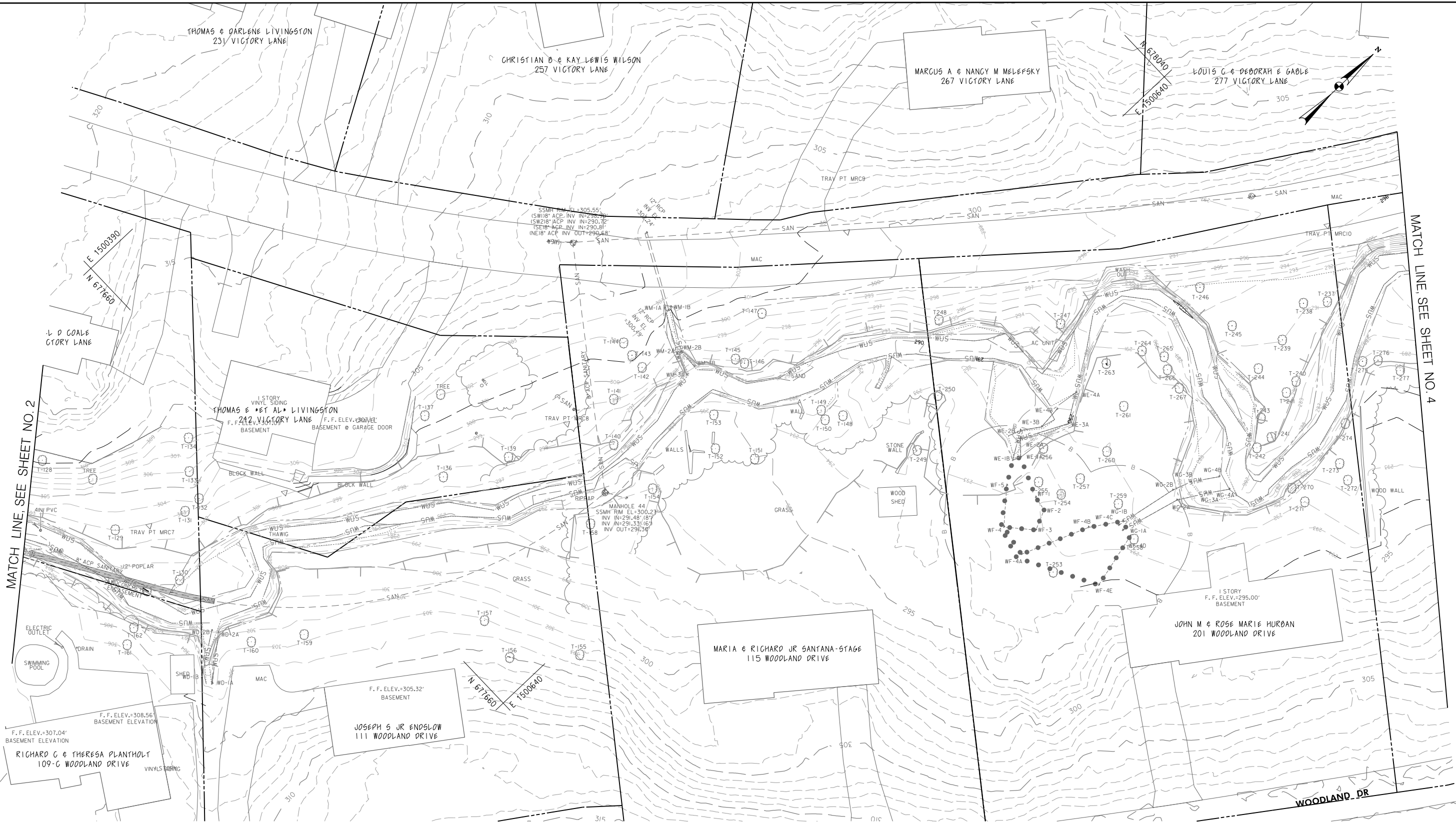
SCALE: 1" = 20'

Revisions	

HARFORD COUNTY, MARYLAND	
WOODLAND RUN STREAM RESTORATION EXISTING CONDITIONS	
Drawn By : <u> RMO/BEA </u>	Scale : <u> 1" = 20' </u>
Designed By : <u> RMO/BEA </u>	Date : <u> AUGUST 2021 </u>
Reviewed By : <u> DMH </u>	Contract No.: <u> XX-XXXX </u>
Drawing No. <u> EX-02 </u> of <u> EX-04 </u>	Sheet No. <u> 04 </u> of <u> 31 </u>

BY: roaks -

PLOTTED: 9/15/2021
FILE: \\balserv05\vol2017\2017\17040_HARCOITask 001_Woodland Run\CADD\plans\05_pEX-0003-Woodland.dgn



LEGEND

- SAN --- EXISTING SANITARY SEWER
- ● ● WETLAND BOUNDARY
- B — 25 FT WETLAND BUFFER
- WUS — WATERS OF THE US
- EXISTING 100 YEAR FLOODPLAIN
- ROW/PROPERTY BOUNDARY
- 320 — EXISTING MAJOR CONTOUR
- 321 — EXISTING MINOR CONTOUR

NOT FOR
CONSTRUCTION

RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME,
AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF
THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

SIGN AND SEAL

Revisions

HARFORD COUNTY, MARYLAND

WOODLAND RUN STREAM RESTORATION EXISTING CONDITIONS

Drawn By : RMO/BEA

Designed By : RMO/BEA

Reviewed By : DMH

Drawing No. EX-03 of EX-04

Scale : 1" = 20'

Date : AUGUST 2021

Contract No.: XX-XXXX

Sheet No. 05 of 31

ADC MAP: 21 GRID: H10

TAX MAP: 0049 GRID: 0003C

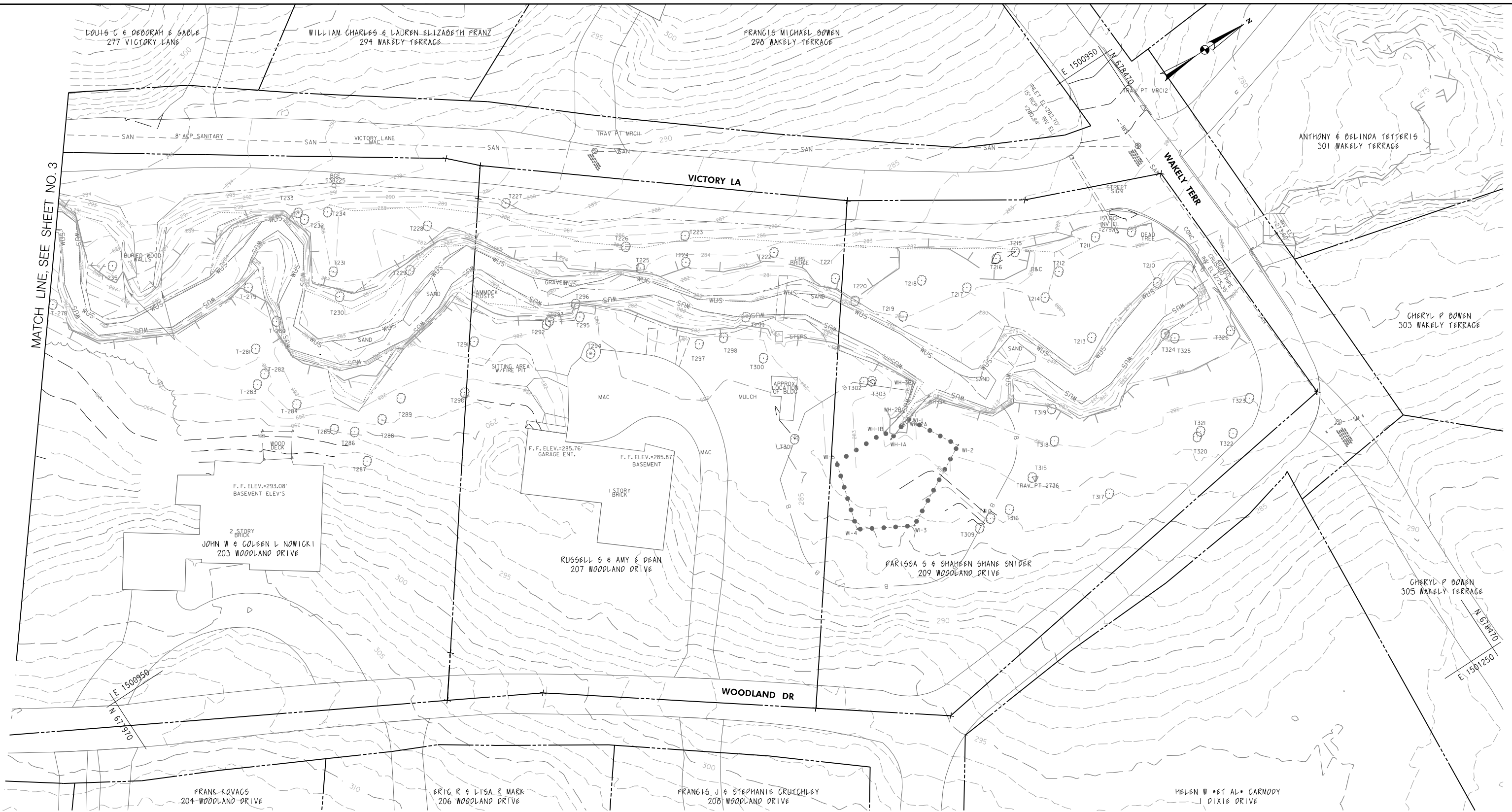
HCG BILLING ID No.:

HCG DWG ID No.:

BY: roaks -

PLOTTED: 9/15/2021
FILE: \\cav05\w2017\17040_HARCO\Task 001_Woodland Run\CADD\plans\06_pEX-0004-Woodland.dgn

MATCH LINE, SEE SHEET NO. 3



LEGEND

- SAN --- EXISTING SANITARY SEWER
- • • WETLAND BOUNDARY
- B — 25 FT WETLAND BUFFER
- WUS — WATERS OF THE US
- EXISTING 100 YEAR FLOODPLAIN
- ROW/PROPERTY BOUNDARY
- 320 — EXISTING MAJOR CONTOUR
- 321 — EXISTING MINOR CONTOUR

NOT FOR
CONSTRUCTION

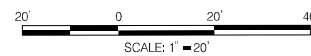
RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME,
AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF
THE STATE OF MARYLAND. LICENSE NO. XXXXX. EXPIRATION DATE: XX/XX/XXXX.

SIGN AND SEAL



Revisions

HARFORD COUNTY, MARYLAND

WOODLAND RUN STREAM RESTORATION EXISTING CONDITIONS

Drawn By : RMQ/BEA

Designed By : RMQ/BEA

Reviewed By : DMH

Drawing No. EX-04 of EX-04

Scale : 1" = 20'

Date : AUGUST 2021

Contract No. : XX-XXXX

Sheet No. 06 of 31

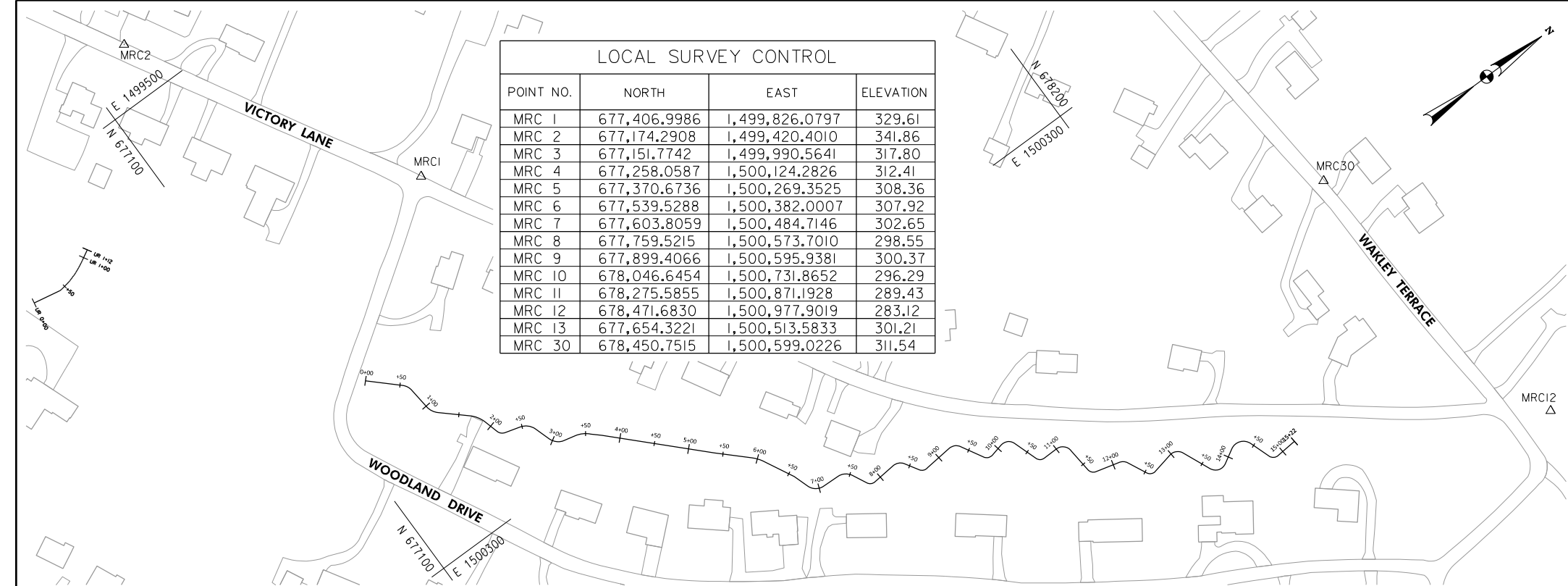
ADC MAP: 21 GRID: H10

TAX MAP: 0049 GRID: 0003C

HCG BILLING ID NO.:

HCG DWG ID No.:
SCALE: 1" = 20'

Woodland Run Tree Inventory																							
Tree ID	Common Name	Scientific Name	DBH	Condition	Notes	Tree ID	Common Name	Scientific Name	DBH	Condition	Notes	Tree ID	Common Name	Scientific Name	DBH	Condition	Notes	Tree ID	Common Name	Scientific Name	DBH	Condition	Notes
T-1	Black cherry	<i>Prunus serotina</i>	14	Fair	Vines/Leaning	T-85	Tulip poplar	<i>Liriodendron tulipifera</i>	27	Fair	Vines/edge of bank	T-252	Bald cypress	<i>Taxodium distichum</i>	12	Fair	Bend/dieback	T-253	Bald cypress	<i>Taxodium distichum</i>	17	Good	Vines/tree flagged not tagged
T-2	Black locust	<i>Robinia pseudoacacia</i>	16	Fair/poor	Dieback/thin crown	T-86	Tulip poplar	<i>Liriodendron tulipifera</i>	18	Fair	Vines	T-169	Black cherry	<i>Prunus serotina</i>	16	Fair	Galls/lichen	T-254	American beech	<i>Fagus grandifolia</i>	19	Fair	Lean/vines/damage at base
T-3	American beech	<i>Fagus grandifolia</i>	40	Good/fair	Poor branching structure	T-87	American beech	<i>Fagus grandifolia</i>	12	Fair	Double trunk below dbh	T-170	Black locust	<i>Robinia pseudoacacia</i>	15	Poor	Vines/dead branches	T-255	Green ash	<i>Fraxinus pennsylvanica</i>	17	Fair	Irregular trunk/lean
T-4	American beech	<i>Fagus grandifolia</i>	59	Fair/poor	Trunk rot/cavities/dieback	T-88	Tulip poplar	<i>Liriodendron tulipifera</i>	25	Fair	Poor branching structure	T-171	Tulip poplar	<i>Liriodendron tulipifera</i>	24	Fair	Vines	T-256	Black cherry	<i>Prunus serotina</i>	14	Fair	Irregular trunk/lean
T-5	Red maple	<i>Acer rubrum</i>	13	Fair	Poor branching structure/edge of bank	T-89	Scarlet oak	<i>Quercus coccinea</i>	37	Fair	Dieback	T-172	Black locust	<i>Robinia pseudoacacia</i>	14	Poor	Vines/lean/dead branches	T-257	Tulip poplar	<i>Liriodendron tulipifera</i>	18	Fair	Lean/thin crown/n/small crack at base
T-6	Red maple	<i>Acer rubrum</i>	17	Fair	Dieback	T-90	Norway maple	<i>Acer platanoides</i>	15	Fair	Poor branching structure	T-173	Persimmon	<i>Diospyros virginiana</i>	17	Good	Bark damage	T-258	Red maple	<i>Acer rubrum</i>	16	Poor	Exposed roots/lean/galls
T-7	Red maple	<i>Acer rubrum</i>	15	Good	Thin crown	T-91	Northern red oak	<i>Quercus rubra</i>	18	Fair	Dieback	T-174	Red maple	<i>Acer rubrum</i>	20	Good		T-259	White oak	<i>Quercus alba</i>	25	Fair	Exposed roots/unbalanced crown n/dieback
T-8	Red maple	<i>Acer rubrum</i>	18	Good/fair	Bend	T-92	Tulip poplar	<i>Liriodendron tulipifera</i>	26	Fair	Vines	T-175	American beech	<i>Fagus grandifolia</i>	30	Good		T-260	Tulip poplar	<i>Liriodendron tulipifera</i>	24	Good	
T-9	Black gum	<i>Nyssa sylvatica</i>	26	Fair/poor	Dieback	T-93	Northern red oak	<i>Quercus rubra</i>	36	Fair	Lean/unbalanced crown n	T-176	White oak	<i>Quercus alba</i>	12	Good		T-261	Tulip poplar	<i>Liriodendron tulipifera</i>	18	Good	
T-10	Red maple	<i>Acer rubrum</i>	24	Good/fair	Dieback	T-94	Tulip poplar	<i>Liriodendron tulipifera</i>	31	Fair/poor	Vines/little to no crown n	T-177	Red maple	<i>Acer rubrum</i>	18	Good		T-262	Green ash	<i>Fraxinus pennsylvanica</i>	13	Poor	Exposed roots/lean/irregular trunk/thin canopy
T-11	Tulip poplar	<i>Liriodendron tulipifera</i>	17	Fair	Bend/uneven crown n	T-95	Red maple	<i>Acer rubrum</i>	19	Fair	Double trunk	T-178	Green ash	<i>Fraxinus pennsylvanica</i>	20	Fair	Lean/dead branches/pruned	T-263	Slippery elm	<i>Ulmus rubra</i>	17	Fair	Lean
T-12	Tulip poplar	<i>Liriodendron tulipifera</i>	16	Good/fair	Thin crown	T-96	Red maple	<i>Acer rubrum</i>	13	Fair	Double trunk	T-179	Green ash	<i>Fraxinus pennsylvanica</i>	19	Fair	Lean/dead branches	T-264	Tulip poplar	<i>Liriodendron tulipifera</i>	15	Fair	Lean/thin canopy
T-13	Tulip poplar	<i>Liriodendron tulipifera</i>	17	Fair	Unbalanced/thin crown n	T-97	Silver maple	<i>Acer saccharinum</i>	12	Fair/poor	Vines/thin crown	T-180	Red maple	<i>Acer rubrum</i>	22	Fair	Lean	T-265	Tulip poplar	<i>Liriodendron tulipifera</i>	16	Fair	Lean/thin canopy
T-14	Tulip poplar	<i>Liriodendron tulipifera</i>	25	Good/fair	Unbalanced crown n	T-98	Red maple	<i>Acer rubrum</i>	12	Fair	Vines/dieback	T-181	Red maple	<i>Acer rubrum</i>	19	Fair	2nd leader 14" DBH/broken branches/avity	T-266	Tulip poplar	<i>Liriodendron tulipifera</i>	13	Fair	Exposed roots/thin canopy
T-15	Tulip poplar	<i>Liriodendron tulipifera</i>	15	Good/fair	Lean/dieback	T-99	Tulip poplar	<i>Liriodendron tulipifera</i>	26	Fair	Dieback	T-182	Tulip poplar	<i>Liriodendron tulipifera</i>	13	Good	Vines	T-267	Tulip poplar	<i>Liriodendron tulipifera</i>	19	Fair	Exposed roots/thin canopy/lean
T-16	Red maple	<i>Acer rubrum</i>	14	Fair/poor	Epicornic bud growth/dieback	T-100	Tulip poplar	<i>Liriodendron tulipifera</i>	34	Fair	Poor branching structure/trunk rot	T-183	Norway spruce	<i>Picea abies</i>	12	Good	Vines	T-268	American beech	<i>Fagus grandifolia</i>	24	Poor	Lean/cavity/vines/irregular trunk
T-18	Tulip poplar	<i>Liriodendron tulipifera</i>	19	Fair	Poor branching structure/split trunk	T-101	Red maple	<i>Acer rubrum</i>	12	Good	Bend/lean	T-184	Northern red oak	<i>Quercus rubra</i>	44	Fair	Vines/pruned branches/dead branches	T-269	Tulip poplar	<i>Liriodendron tulipifera</i>	13	Fair	Exposed roots/irregular roots/thin canopy
T-17	Tulip poplar	<i>Liriodendron tulipifera</i>	19	Fair	Poor branching structure/split trunk	T-102	Norway maple	<i>Acer platanoides</i>	13	Fair	English ivy	T-185	White pine	<i>Pinus strobus</i>	12	Fair	Vines/dead branches	T-270	American beech	<i>Fagus grandifolia</i>	19	Fair	Exposed roots/dieback/unbalanced crown n
T-19	Red maple	<i>Acer rubrum</i>	15	Good/fair	Dieback	T-103	Black locust	<i>Robinia pseudoacacia</i>	25	Fair	Missing limbs/bark/broken branches	T-186	Silver maple	<i>Acer saccharinum</i>	13	Fair	Vines	T-271	Tulip poplar	<i>Liriodendron tulipifera</i>	32	Fair	Thin canopy/vines/dieback
T-20	Tulip poplar	<i>Liriodendron tulipifera</i>	23	Fair/poor	Dieback/irregular growth form/thin crown/trunk cavity	T-104	White pine	<i>Pinus strobus</i>	15	Fair	Vines	T-187	Silver maple	<i>Acer saccharinum</i>	13	Fair	Vines	T-272	American sycamore	<i>Platanus occidentalis</i>	19	Fair	Vines/broken branches/unbalanced crown n
T-21	Tulip poplar	<i>Liriodendron tulipifera</i>	26	Fair	Lean/dieback/thin crown n	T-105	Red maple	<i>Acer rubrum</i>	18	Good	Double trunk/lean	T-188	Moccasin hickory	<i>Carya tomentosa</i>	22	Good	Vines	T-273	Red maple	<i>Acer rubrum</i>	23	Poor	Lean/trunk twist/dieback
T-22	Red maple	<i>Acer rubrum</i>	12	Fair	Poor branching structure/moderate dead wood	T-106	White pine	<i>Pinus strobus</i>	15	Good	Vines	T-189	Green ash	<i>Fraxinus pennsylvanica</i>	23	Fair	Pruned/lean	T-274	American beech	<i>Fagus grandifolia</i>	19	Poor	Exposed roots/bank/vines/lean/unbalanced crown n
T-23	Tulip poplar	<i>Liriodendron tulipifera</i>	15	Fair	Bend/dieback/thin crown n	T-106A	Green ash	<i>Fraxinus pennsylvanica</i>	12	Good	Lean	T-190	Green ash	<i>Fraxinus pennsylvanica</i>	22	Good		T-275	Tulip poplar	<i>Liriodendron tulipifera</i>	21	Fair	Exposed roots/lean/bank/vines
T-24	Tulip poplar	<i>Liriodendron tulipifera</i>	24	Fair	Vines/poor branching structure	T-107	Tulip poplar	<i>Liriodendron tulipifera</i>	14	Fair	Lean/vines	T-191	Black gum	<i>Nyssa sylvatica</i>	12	Poor	Exposed roots/bank	T-276	Tulip poplar	<i>Liriodendron tulipifera</i>	15	Good	
T-25	Tulip poplar	<i>Liriodendron tulipifera</i>	49	Poor	Missing trunk/bend/poor branching structure/vines	T-108	Red maple	<i>Acer rubrum</i>	28	Fair	Missing bark/broken branches	T-192	Red maple	<i>Acer rubrum</i>	20	Fair	Lean/2nd leader 16 DBH	T-277	Tulip poplar	<i>Liriodendron tulipifera</i>	12	Fair	Vines/thin canopy
T-26	Red maple	<i>Acer rubrum</i>	22	Fair/poor	Vines/lean/dieback	T-109	Green ash	<i>Fraxinus pennsylvanica</i>	17	Fair	Lean	T-193	Persimmon	<i>Diospyros virginiana</i>	19	Fair	2nd leader 18 DBH/regular trunk/lean/vines	T-278	Tulip poplar	<i>Liriodendron tulipifera</i>	16	Fair	Lean/thin canopy
T-27	Tulip poplar	<i>Liriodendron tulipifera</i>	13	Fair	Bend/vines	T-110	Black locust	<i>Robinia pseudoacacia</i>	14	Fair	Bend/vines/lean	T-194	Persimmon	<i>Diospyros virginiana</i>	20	Fair	Lean	T-279	American beech	<i>Fagus grandifolia</i>	22	Fair	Exposed roots/lean
T-28	Black cherry	<i>Prunus serotina</i>	26	Fair/poor	Lean/vines/bend/trunk rot	T-111	Pignut hickory	<i>Carya glabra</i>	14	Fair	Vines/broken branches	T-195	Black cherry	<i>Prunus serotina</i>	13	Poor	Lean/dead branch	T-280	Tulip poplar	<i>Liriodendron tulipifera</i>	18	Poor	Lean/thin crown/edge of bank/dieback
T-29	Black cherry	<i>Prunus serotina</i>	27	Fair/poor	Vines/lean/broken branches	T-112	Green ash	<i>Fraxinus pennsylvanica</i>	16	Fair	Lean/vines	T-196	Tulip poplar	<i>Liriodendron tulipifera</i>	25	Good		T-281	Tulip poplar	<i>Liriodendron tulipifera</i>	15	Fair	Thin crown
T-30	Black locust	<i>Robinia pseudoacacia</i>	17	Fair/poor	Lean/vines	T-113	White pine	<i>Pinus strobus</i>	14	Good	Vines	T-197	Silver maple	<i>Acer saccharinum</i>	15	Fair	Lean	T-282	Tulip poplar	<i>Liriodendron tulipifera</i>	15	Fair	Vines
T-31	Black locust	<i>Robinia pseudoacacia</i>	20	Fair/poor	Lean/vines	T-114	Green ash	<i>Fraxinus pennsylvanica</i>	22	Fair	Vines/broken branches	T-198	Northern red oak	<i>Quercus rubra</i>	32	Good	Vines	T-283	Tulip poplar	<i>Liriodendron tulipifera</i>	20	Fair	Lean/thin crown
T-32	Tulip poplar	<i>Liriodendron tulipifera</i>	5	Good/fair	Lean/uneven crown n	T-115	Silver maple	<i>Acer saccharinum</i>	15	Fair	Lean/ivy	T-199	White oak	<i>Quercus alba</i>	46	Fair	Vines	T-284	Tulip poplar	<i>Liriodendron tulipifera</i>	24	Fair	Lean/dieback
T-33	Black locust	<i>Robinia pseudoacacia</i>	28	Poor	Edge of bank/lean/vines/trunk cavities	T-116	Northern red oak	<i>Quercus rubra</i>	26	Fair	Vines/dead branches	T-200	Red maple	<i>Acer rubrum</i>	16	Poor	Cavity/vines/2nd leader 12" DBH	T-285	Tulip poplar	<i>Liriodendron tulipifera</i>	29	Fair	Vines/thin crown n
T-34	Black locust	<i>Robinia pseudoacacia</i>	27	Poor	Edge of bank/lean/vines/trunk cavities	T-117	Tulip poplar	<i>Liriodendron tulipifera</i>	28	Fair	Vines	T-201	American beech	<i>Fagus grandifolia</i>	12	Good		T-286	Tulip poplar	<i>Liriodendron tulipifera</i>	26	Fair	Vines/thin crown n
T-35	Black locust	<i>Robinia pseudoacacia</i>	18	Poor	Lean/trunk cavity/vines n	T-118	Red maple	<i>Acer rubrum</i>	14	Good		T-202	Red maple	<i>Acer rubrum</i>	25	Fair	Vines/split below breast height/2nd leader 15" DBH	T-287	Tulip poplar	<i>Liriodendron tulipifera</i>	29	Fair	Vines/thin crown n/dieback
T-36	Black cherry	<i>Prunus serotina</i>	12	Fair/poor	Lean/vines	T-119	Southern magnolia	<i>Magnolia grandiflora</i>	25	Fair	Multiple trunks split below DBH 24", 15", and 16"	T-203	Northern red oak	<i>Quercus rubra</i>	25	Good		T-288	Tulip poplar	<i>Liriodendron tulipifera</i>	15	Fair	Thin crown n
T-37	Black gum	<i>Nyssa sylvatica</i>	33	Fair/poor	Vines/broken branches	T-120	Red maple	<i>Acer rubrum</i>	18	Fair	Unbalanced crown n	T-204	Tulip poplar	<i>Liriodendron tulipifera</i>	20	Fair	Irregular trunk/galls/lean	T-289	Tulip poplar	<i>Liriodendron tulipifera</i>	23	Good	
T-38	Tulip poplar	<i>Liriodendron tulipifera</i>	23	Good		T-121	Red maple	<i>Acer rubrum</i>	25	Fair	Vines	T-205	Tulip poplar	<i>Liriodendron tulipifera</i>	28	Good		T-290	Tulip poplar	<i>Liriodendron tulipifera</i>	13	Good	
T-39	Red maple	<i>Acer rubrum</i>	12	Fair	Trunk cavity	T-122	Hedge maple	<i>Acer campestre</i>	13	Good	Woodpecker damage	T-206	Tulip poplar	<i>Liriodendron tulipifera</i>	14	Good		T-291	American beech	<i>Fagus grandifolia</i>	28	Fair	Exposed roots/dieback
T-40	Tulip poplar	<i>Liriodendron tulipifera</i>	17	Fair	Vines/irregular growth form/bend	T-123	American chestnut	<i>Castanea dentata</i>	22	Fair	Vines	T-207	Red maple	<i>Acer rubrum</i>	20	Poor	Exposed roots/lean/bank/galls	T-292	American beech	<i>Fagus grandifolia</i>	17	Fair	Lean/fused with white oak/pruned
T-41	White pine	<i>Pinus strobus</i>	17	Fair	Lean/dieback	T-124	Black cherry	<i>Prunus serotina</i>	26	Poor	Vines/galls/dieback	T-208	Tulip poplar	<i>Liriodendron tulipifera</i>	25	Fair	Exposed roots on bank	T-293	White oak	<i>Quercus alba</i>	0	Fair	Exposed roots/bank/fused with beech/lean
T-42	White pine	<i>Pinus strobus</i>	15	Fair	Lean/dieback	T-125	Southern magnolia	<i>Magnolia grandiflora</i>	22	Fair	Lean/on slope	T-209	Red maple	<i>Acer rubrum</i>	35	Fair	Vines/small cavity	T-294	American beech	<i>Fagus grandifolia</i>	21	Good	
T-43	White pine	<i>Pinus strobus</i>	17	Fair	Lean/dieback	T-126	Tulip poplar	<i>Liriodendron tulipifera</i>	15	Fair	Lean	T-210	American beech	<i>Fagus grandifolia</i>	25	Fair	Lean/exposed roots/bank	T-295	White oak	<i>Quercus alba</i>	27	Fair	Lean/exposed roots/bank
T-44	White pine	<i>Pinus strobus</i>	18	Fair/poor	Lean/dieback	T-127	Red maple	<i>Acer rubrum</i>	22	Fair	Vines/exposed roots/broken branches/on slope	T-211	Green ash	<i>Fraxinus pennsylvanica</i>	17	Good		T-296	American beech	<i>Fagus grandifolia</i>	19	Fair	Exposed roots/bank/vines
T-45	White pine	<i>Pinus strobus</i>	19	Fair/poor	Lean/dieback	T-128	Catalpa	<i>Catalpa speciosa</i>	22	Fair	Lean/vines/on slope	T-212	American beech	<i>Fagus grandifolia</i>	28	Fair	Lean	T-297	American beech	<i>Fagus grandifolia</i>	21	Fair	Dieback/vines
T-46	Red maple	<i>Acer rubrum</i>	23	Good/fair	Vines	T-129	Tulip poplar	<i>Liriodendron tulipifera</i>	18	Good		T-213	American beech	<i>Fagus grandifolia</i>	27	Fair	Vines/irregular trunk	T-298	Tulip poplar	<i>Liriodendron tulipifera</i>	15	Fair	Lean/thin crown n/exposed roots/bank
T-47	Red maple	<i>Acer rubrum</i>	12	Fair	Vines/lean	T-130	American sycamore	<i>Platanus occidentalis</i>	21	Fair	Lean/vines	T-214	Tulip poplar	<i>Liriodendron tulipifera</i>	35	Fair	Splits below breast height/2nd leader is 32" DBH	T-299	Red maple	<i>Acer rubrum</i>	16	Poor	Lean/exposed roots/irregular trunk/bank
T-48	American elm	<i>Ulmus americana</i>	14	Fair/poor	Lean/vines/dieback	T-131	Pignut hickory	<i>Carya glabra</i>	17	Fair	Vines	T-215	Tulip poplar	<i>Liriodendron tulipifera</i>	18	Fair	Lean/vines	T-300	Black gum	<i>Nyssa sylvatica</i>	13	Poor	Cavity/thin crown/lean/missing bark
T-49	White mulberry	<i>Morus alba</i>	20	Poor	Lean/dieback/poor structure/vines	T-132	Tulip poplar	<i>Liriodendron tulipifera</i>	35	Poor	Split trunk below DBH/vines/irregular trunk	T-216	Tulip poplar	<i>Liriodendron tulipifera</i>	20	Fair	Vines	T-301	Red maple	<i>Acer rubrum</i>	26	Fair	Vines/lean/dieback
T-50	White mulberry	<i>Morus alba</i>	16	Fair/poor	Lean/vines	T-133	American beech	<i>Fagus grandifolia</i>	29	Good	Vines	T-217	Tulip poplar	<i>Liriodendron tulipifera</i>	20	Fair	Vines/galls	T-302	Tulip poplar	<i>Liriodendron tulipifera</i>	26	Fair	Exposed roots/bark damage/lean/thin crown n
T-51	Silver maple	<i>Acer saccharinum</i>	20	Fair	Lean/vines	T-134	Catalpa	<i>Catalpa speciosa</i>	39	Poor	Lean/one sided crown n/vines	T-218	American beech	<i>Fagus grandifolia</i>	28	Good/fair	Exposed roots/dead branches	T-303	Tulip poplar	<i>Liriodendron tulipifera</i>	23	Fair	Exposed roots/bark damage/lean/thin crown n/dieback
T-52	Red maple	<i>Acer rubrum</i>	30	Fair	Dieback	T-135	Black oak	<i>Quercus velutina</i>	32	Fair	Lean/dead branches	T-219	American beech	<i>Fagus grandifolia</i>	17	Good							



STREAM RESTORATION CURVE DATA											
Curve	1	2	3	4	5	6	7	8	9	10	11
Radius	12	12	25	25	25	25	25	25	25	25	25
Delta	34°05'15.51" Left	53°49'51.78" Right	32°34'36.80" Left	16°54'40.40" Left	45°31'34.09" Right	29°52'57.30" Left	24°31'29.73" Left	49°25'14.09" Right	37°56'22.44" Left	9°24'20.92" Right	30°32'25.25" Right
Degree of Curve	477°27'53.39"	477°27'53.39"	229°10'59.22"	229°10'59.22"	229°10'59.22"	229°10'59.22"	229°10'59.22"	229°10'59.22"	229°10'59.22"	229°10'59.22"	229°10'59.22"
Length	7.1393	11.2743	14.2143	7.3789	19.8645	13.0387	10.701	21.5638	16.5543	4.1041	13.3257
Tangent	3.6788	6.092	7.305	3.7165	10.4901	6.6713	5.4337	11.5042	8.5934	2.0567	6.8252
Chord	7.0345	10.8642	14.0237	7.3522	19.3461	12.8915	10.6195	20.9015	16.2535	4.0995	13.1685
Middle Ordinate	0.527	1.2999	1.0035	0.2717	1.9472	0.8452	0.5704	2.2892	1.3577	0.0842	0.8826
External	0.5512	1.4578	1.0454	0.2747	2.1117	0.8748	0.5837	2.5199	1.4357	0.0845	0.9149
Tangent Direction	N 57°56'40.65" E	N 23°51'25.14" E	N 77°41'16.92" E	N 45°06'40.12" E	N 28°11'59.73" E	N 73°43'33.82" E	N 43°50'36.52" E	N 19°19'06.79" E	N 68°44'20.87" E	N 30°47'58.44" E	N 40°12'19.36" E
Radial Direction	N 32°03'19.35" W	N 66°08'34.86" W	N 12°18'43.08" W	N 44°53'19.88" W	N 61°48'00.27" W	N 16°16'26.18" W	N 46°09'23.48" W	N 70°40'53.21" W	N 21°15'39.13" W	N 59°12'01.56" W	N 49°47'40.64" W
Chord Direction	N 40°54'02.90" E	N 50°46'21.03" E	N 61°23'58.52" E	N 36°39'19.92" E	N 50°57'46.77" E	N 58°47'05.17" E	N 31°34'51.65" E	N 44°01'43.83" E	N 49°46'09.66" E	N 35°30'08.90" E	N 55°28'31.99" E
Radial Direction	N 66°08'34.86" W	N 12°18'43.08" W	N 44°53'19.88" W	N 61°48'00.27" W	N 16°16'26.18" W	N 46°09'23.48" W	N 70°40'53.21" W	N 21°15'39.13" W	N 59°12'01.56" W	N 49°47'40.64" W	N 19°15'15.39" W
Tangent Direction	N 23°51'25.14" E	N 77°41'16.92" E	N 45°06'40.12" E	N 28°11'59.73" E	N 73°43'33.82" E	N 43°50'36.52" E	N 19°19'06.79" E	N 68°44'20.87" E	N 30°47'58.44" E	N 40°12'19.36" E	N 70°44'44.61" E
Curve	12	13	14	15	16	17	18	19	20	21	22
Radius	25	25	25	25	25	25	25	25	25	25	25
Delta	28°49'59.05" Left	10°42'34.35" Left	13°07'40.87" Right	15°39'29.88" Right	51°53'26.89" Left	44°05'14.98" Right	54°19'33.17" Left	29°24'29.50" Right	26°08'44.65" Left	31°48'23.54" Right	48°07'25.65" Right
Degree of Curve	229°10'59.22"	229°10'59.22"	229°10'59.22"	229°10'59.22"	229°10'59.22"	229°10'59.22"	229°10'59.22"	229°10'59.22"	229°10'59.22"	229°10'59.22"	229°10'59.22"
Length	12.5808	4.6729	5.7282	6.8322	22.6416	19.2368	23.7041	12.8317	11.4082	13.8782	20.998
Tangent	6.4266	2.3433	2.4375	3.4375	12.1638	10.1229	12.6308	6.5605	5.8052	7.123	11.1631
Chord	12.4485	4.6661	5.7157	6.811	21.8757	18.7657	22.8261	12.6914	11.3095	13.7007	20.3862
Middle Ordinate	0.7872	0.1091	0.1639	0.233	2.5197	1.8276	2.7572	0.8188	0.6479	0.9569	2.1724
External	0.8128	0.1096	0.165	0.2352	2.8021	1.9717	3.099	0.8465	0.6652	0.9949	2.3791
Tangent Direction	N 70°44'44.61" E	N 41°54'45.56" E	N 31°12'11.21" E	N 44°19'52.08" E	N 59°59'21.96" E	N 8°05'55.07" E	N 52°11'10.05" E	N 2°08'23.12" W	N 27°16'06.38" E	N 1°07'21.73" E	N 32°55'45.27" E
Radial Direction	N 19°15'15.39" W	N 48°05'14.44" W	N 58°47'48.79" W	N 45°40'07.92" W	N 30°00'38.04" W	N 81°54'04.93" W	N 37°48'49.95" W	N 87°51'36.88" E	N 62°43'53.62" W	N 88°52'38.27" W	N 57°04'14.73" W
Chord Direction	N 56°19'45.08" E	N 36°33'28.38" E	N 37°46'01.64" E	N 52°09'37.02" E	N 34°02'38.52" E	N 30°08'32.56" E	N 25°01'23.46" E	N 12°33'51.63" E	N 14°11'44.05" E	N 17°01'33.50" E	N 56°59'28.10" E
Radial Direction	N 48°05'14.44" W	N 58°47'48.79" W	N 45°40'07.92" W	N 30°00'38.04" W	N 81°54'04.93" W	N 37°48'49.95" W	N 87°51'36.88" E	N 62°43'53.62" W	N 88°52'38.27" W	N 57°04'14.73" W	N 8°56'49.08" W
Tangent Direction	N 41°54'45.56" E	N 31°12'11.21" E	N 44°19'52.08" E	N 59°59'21.96" E	N 8°05'55.07" E	N 52°11'10.05" E	N 2°08'23.12" W	N 27°16'06.38" E	N 1°07'21.73" E	N 32°55'45.27" E	N 81°03'10.92" E
Curve	23	24	25	26	27	28	29	30			
Radius	25	12	25	25	25	25	25	25			
Delta	60°24'38.05" Left	70°29'33.23" Right	55°52'40.64" Left	48°44'40.71" Right	35°16'32.43" Left	28°09'54.79" Left	47°52'53.28" Right	33°30'27.57" Left			
Degree of Curve	229°10'59.22"	477°27'53.39"	229°10'59.22"	229°10'59.22"	229°10'59.22"	229°10'59.22"	229°10'59.22"	229°10'59.22"			
Length	26.3591	14.7639	24.3814	21.2689	15.3919	12.2894	20.8922	14.6205			
Tangent	14.5534	8.4796	13.2586	11.3259	7.9486	6.2715	11.0997	7.526			
Chord	25.155	13.8502	23.4265	20.6332	15.15	12.166	20.2896	14.413			
Middle Ordinate	3.3943	2.1999	2.9138	2.2279	1.1752	0.7514	2.1509	1.0612			
External	3.9275	2.6937	3.2982	2.4459	1.2332	0.7746	2.3533	1.1082			
Tangent Direction	N 81°03'10.92" E	N 20°38'32.87" E	N 69°37'53.96" E	N 13°45'13.32" E	N 62°29'54.03" E	N 27°13'21.61" E	N 0°56'33.18" W	N 46°56'20.10" E			
Radial Direction	N 8°56'49.08" W	N 69°21'27.13" W	N 20°22'06.04" W	N 76°14'46.68" W	N 27°30'05.97" W	N 62°46'38.39" W	N 89°03'26.82" E	N 43°03'39.90" W			
Chord Direction	N 50°50'51.90" E	N 55°53'19.49" E	N 41°41'33.64" E	N 38°07'33.68" E	N 44°51'37.82" E	N 13°08'24.21" E	N 22°59'53.46" E	N 30°11'06.31" E			
Radial Direction	N 69°21'27.13" W	N 1°08'06.10" E	N 76°14'46.68" W	N 27°30'05.97" W	N 62°46'38.39" W	N 89°03'26.82" E	N 43°03'39.90" W	N 76°34'07.47" W			
Tangent Direction	N 20°38'32.87" E	N 88°51'53.90" W	N 13°45'13.32" E	N 62°29'54.03" E	N 27°13'21.61" E	N 0°56'33.18" W	N 46°56'20.10" E	N 13°25'52.53" E			
Curve	31	32	33	34	35						
Radius	20	25	25	20	20						
Delta	32°43'20.40" Right	19°56'33.05" Right	51°48'00.67" Left	48°17'19.04" Right	39°02'42.54" Left						
Degree of Curve	286°28'44.03"	229°10'59.22"	229°10'59.22"	286°28'44.03"	286°28'44.03"						
Length	11.4222	8.7016	22.6021	16.8559	13.6293						
Tangent	5.8716	4.3952	12.1394	8.965	7.0912						
Chord	11.2676	8.6577	21.8402	16.3615	13.3671						
Middle Ordinate	0.8099	0.3776	2.5111	1.7496	1.1498						
External	0.8441	0.3834	2.7915	1.9174	1.2199						
Tangent Direction	N 5°26'14.78" E	N 38°09'35.18" E	N 58°06'08.23" E	N 6°18'07.56" E	N 40°00'08.92" E						
Radial Direction	N 84°33'45.22" W	N 51°50'24.82" W	N 31°53'51.77" W	N 83°41'52.44" W	N 49°59'51.08" W						
Chord Direction	N 21°47'54.98" E	N 48°07'51.70" E	N 32°12'07.89" E	N 30°26'47.08" E	N 20°28'47.65" E						
Radial Direction	N 51°50'24.82" W	N 31°53'51.77" W	N 83°41'52.44" W	N 35°24'33.40" W	N 89°02'33.62" W						
Tangent Direction	N 38°09'35.18" E	N 58°06'08.23" E	N 6°18'07.56" E	N 54°35'26.60" E	N 0°57'26.38" E						

NOT FOR
CONSTRUCTION



P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists

www.rk&k.com

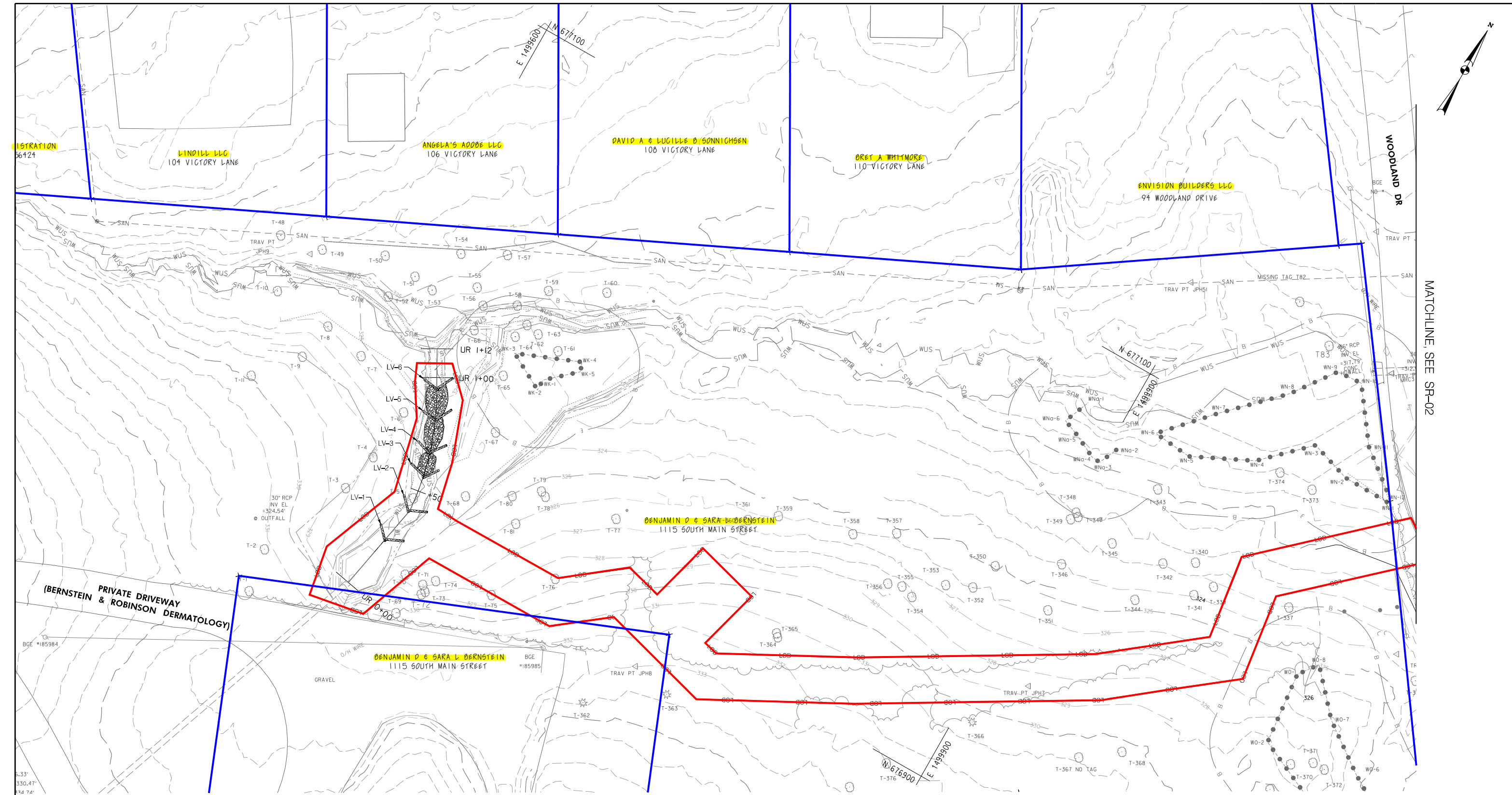
Responsive People | Creative Solutions

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

SIGN AND SEAL

STREAM RESTORATION LR ALIGNMENT			STREAM RESTORATION LR ALIGNMENT		
STATION	NORTH	EAST	STATION	NORTH	EAST
POB 00+00.00	677,148.25	1,499,983.20	PI 09+38.46	677,785.81	1,500,596.02
PC 00+80.56	677,191.00	1,500,051.48	CC Curve SR-20	677,792.10	1,500,571.13
PI 00+84.24	677,192.96	1,500,054.60	PT 09+44.07	677,791.61	1,500,596.13
CC Curve SR-1	677,201.17	1,500,045.11	PC 09+69.39	677,816.93	1,500,596.63
PT 00+87.70	677,196.32	1,500,056.09	PI 09+76.51	677,824.06	1,500,596.77
PC 01+08.82	677,215.63	1,500,064.63	CC Curve SR-21	677,816.44	1,500,621.62
PI 01+14.91	677,221.20	1,500,067.09	PT 09+83.27	677,830.03	1,500,600.64
CC Curve SR-2	677,210.78	1,500,075.60	PC 10+03.24	677,846.79	1,500,611.49
PT 01+20.09	677,222.50	1,500,073.04	PI 10+14.40	677,856.16	1,500,617.56
PC 01+66.31	677,232.36	1,500,118.20	CC Curve SR-22	677,833.20	1,500,632.47
PI 01+73.62	677,233.92	1,500,125.34	PT 10+24.23	677,857.90	1,500,628.59
CC Curve SR-3	677,256.78	1,500,112.87	PC 10+41.20	677,860.54	1,500,645.35
PT 01+80.53	677,239.07	1,500,130.51	PI 10+55.76	677,862.80	1,500,659.72
PC 02+15.25	677,263.58	1,500,155.11	CC Curve SR-23	677,885.23	1,500,641.46
PI 02+18.97	677,266.20	1,500,157.75	PT 10+67.56	677,876.42	1,500,664.86
CC Curve SR-4	677,281.29	1,500,137.47	PC 11+3.98	677,919.86	1,500,681.22
PT 02+22.63	677,269.47	1,500,159.50	PI 11+22.46	677,927.79	1,500,684.21
PC 02+46.19	677,290.24	1,500,170.63	CC Curve SR-24	677,915.63	1,500,692.45
PI 02+56.68	677,299.48	1,500,175.59	PT 11+28.74	677,927.63	1,500,692.69
CC Curve SR-5	677,278.42	1,500,192.67	PC 11+45.50	677,927.29	1,500,709.44
PT 02+66.05	677,302.42	1,500,185.66	PI 11+74.62	677,937.43	1,500,736.74
PC 03+08.53	677,314.32	1,500,226.44	PT 11+87.88	677,942.04	1,500,749.17
PI 03+15.20	677,316.19	1,500,232.84	CC Curve SR-25	677,960.87	1,500,728.04
CC Curve SR-6	677,338.32	1,500,219.43	PT 11+99.00	677,954.92	1,500,752.32
PT 03+21.57	677,321.00	1,500,237.46	PC 12+37.47	677,992.29	1,500,761.46
PC 03+60.16	677,348.84	1,500,264.20	PI 12+48.79	678,003.29	1,500,764.16
PI 03+65.60	677,352.76	1,500,267.96	CC Curve SR-26	677,986.34	1,500,785.75
CC Curve SR-7	677,366.16	1,500,246.16	PT 12+58.73	678,008.52	1,500,774.20
PT 03+70.86	677,357.89	1,500,269.76	PC 13+08.75	678,031.61	1,500,818.57
PC 03+94.49	677,380.19	1,500,277.57	PI 13+16.70	678,035.28	1,500,825.62
PI 04+06.00	677,391.04	1,500,281.38	CC Curve SR-27	678,053.79	1,500,807.02
CC Curve SR-8	677,371.91	1,500,301.17	PT 13+24.14	678,042.35	1,500,829.25
PT 04+16.06	677,395.21	1,500,292.10	PC 13+48.15	678,063.70	1,500,840.24
PC 04+40.08	677,403.92	1,500,314.49	PI 13+54.42	678,069.28	1,500,843.11
PI 04+48.67	677,407.04	1,500,322.50	CC Curve SR-28	678,075.14	1,500,818.01
CC Curve SR-9	677,427.22	1,500,305.42	PT 13+60.44	678,075.55	1,500,843.00
PT 04+56.63	677,414.42	1,500,326.90	PC 14+03.82	678,118.92	1,500,842.29
PC 04+92.54	677,445.27	1,500,345.28	PI 14+14.92	678,130.02	1,500,842.11
PI 04+94.60	677,447.04	1,500,346.34	CC Curve SR-29	678,119.34	1,500,867.29
CC Curve SR-10	677,432.47	1,500,366.76	PT 14+24.71	678,137.60	1,500,850.22
PT 04+96.65	677,448.61	1,500,347.67	PC 14+73.45	678,170.88	1,500,885.83
PC 05+18.07	677,464.96	1,500,361.49	PI 14+80.98	678,176.02	1,500,891.32
PI 05+24.89	677,470.18	1,500,365.90	CC Curve SR-30	678,189.14	1,500,868.76
CC Curve SR-11	677,448.82	1,500,380.58	PT 14+88.07	678,183.34	1,500,893.07
PT 05+31.39	677,472.43	1,500,372.34	PI 15+09.59	678,204.26	1,500,898.07
PC 05+43.70	677,476.48	1,500,383.96	PC 15+51.18	678,245.66	1,500,902.01
PI 05+50.12	677,478.60	1,500,390.02	PI 15+57.05	678,251.51	1,500,902.57
CC Curve SR-12	677,500.09	1,500,375.71	CC Curve SR-31	678,243.77	1,500,921.92
PT 05+56.28	677,483.39	1,500,394.32	PT 15+62.60	678,256.13	1,500,906.20
PI 06+10.73	677,523.91	1,500,430.69	PC 15+99.79	678,285.37	1,500,929.17
PC 06+32.00	677,539.73	1,500,444.90	PI 16+04.18	678,288.82	1,500,931.89
PI 06+34.34	677,541.48	1,500,446.46	CC Curve SR-32	678,269.92	1,500,948.81
CC Curve SR-13	677,556.43	1,500,426.29	PT 16+08.49	678,291.15	1,500,935.62
PT 06+36.67	677,543.48	1,500,447.68	PC 16+47.17	678,311.59	1,500,968.46
PC 06+68.53	677,570.73	1,500,464.18	PI 16+59.31	678,318.00	1,500,978.77
PI 06+71.40	677,573.19	1,500,465.67	CC Curve SR-33	678,332.81	1,500,955.25
CC Curve SR-14	677,557.78	1,500,485.56	PT 16+69.77	678,330.07	1,500,980.10
PT 06+74.25	677,575.25	1,500,467.68	PC 16+94.19	678,354.34	1,500,982.78
PC 06+94.50	677,589.73	1,500,481.83	PI 17+03.16	678,363.25	1,500,983.77
PI 06+97.94	677,592.19	1,500,484.23	CC Curve SR-34	678,352.14	1,501,002.66
CC Curve SR-15	677,572.26	1,500,499.71	PT 17+11.05	678,368.44	1,500,991.07
PT 07+01.33	677,593.91	1,500,487.21	PI 17+60.32	678,396.99	1,501,031.23
PC 07+37.99	677,612.24	1,500,518.95	PC 17+87.82	678,418.06	1,501,048.91
PI 07+50.16	677,618.33	1,500,529.49	PT 17+94.91	678,423.49	1,501,053.47
CC Curve SR-16	677,633.89	1,500,506.45	CC Curve SR-35	678,430.91	1,501,033.59
PT 07+60.64	677,630.37	1,500,531.20	PT 18+01.45	678,430.58	1,501,053.59
PC 07+80.91	677,650.45	1,500,534.06	PI 18+18.30	678,447.43	1,501,053.87
PI 07+91.03	677,660.47	1,500,535.48	POE 18+60.28	678,489.40	1,501,053.36
CC Curve SR-17	677,646.92	1,500,558.81			
PT 08+00.15	677,666.67	1,500,543.48			
PC 08+29.15	677,684.46	1,500,566.39			
PI 08+41.98	677,692.32	1,500,576.53			
CC Curve SR-18	677,704.21	1,500,551.07			
PT 08+52.86	677,705.14	1,500,576.05			
PC 08+85.42	677,737.68	1,500,574.83			
PI 08+91.98	677,744.24	1,500,574.59			
CC Curve SR-19	677,738.62	1,500,599.82			
PT 08+98.26	677,750.07	1,500,577.59			
PC 09+32.66	677,780.65	1,500,593.36			



BY: roaks -

PLOTTED: 9/15/2021
FILE: \\balsrv05\w2017\1717040_HARCO\Task\01_Woodland Run\CADD\plans\05_SRF-001-Woodland.dgn

LEGEND

— SAN —	EXISTING SANITARY SEWER		RIFFLE GRADE CONTROL MIX		5' OPEN BACK COG INLET
● ● ●	WETLAND BOUNDARY		STONE TOE		WOODY DEBRIS
— B —	25 FT WETLAND BUFFER		FLOODPLAIN LOG		RIPRAP
— WUS —	WATERS OF THE US		LOG VANE		PROPOSED SEWER ENCASEMENT
	PRELIMINARY 100 YEAR FLOODPLAIN		PROPOSED CHANNEL		
---	ROW/PROPERTY BOUNDARY		PROPOSED EXTRUDED CURB		
---	ACCESS ROAD		LIMIT OF DISTURBANCE		

LEGEND:

	LIMIT OF DISTURBANCE FROM CONSTRUCTION
	PROPERTY LINE

NOT FOR CONSTRUCTION

RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists
www.rk.com

Responsive People | Creative Solutions

BILLING NO. XXXXXX

EG-SWMENG- XXXXXX-XXXX #XXXX

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

SIGN AND SEAL

20' 0 20' 40'

SCALE: 1" = 20'

HARFORD COUNTY, MARYLAND

**WOODLAND RUN
STREAM RESTORATION
STREAM RESTORATION PLAN**

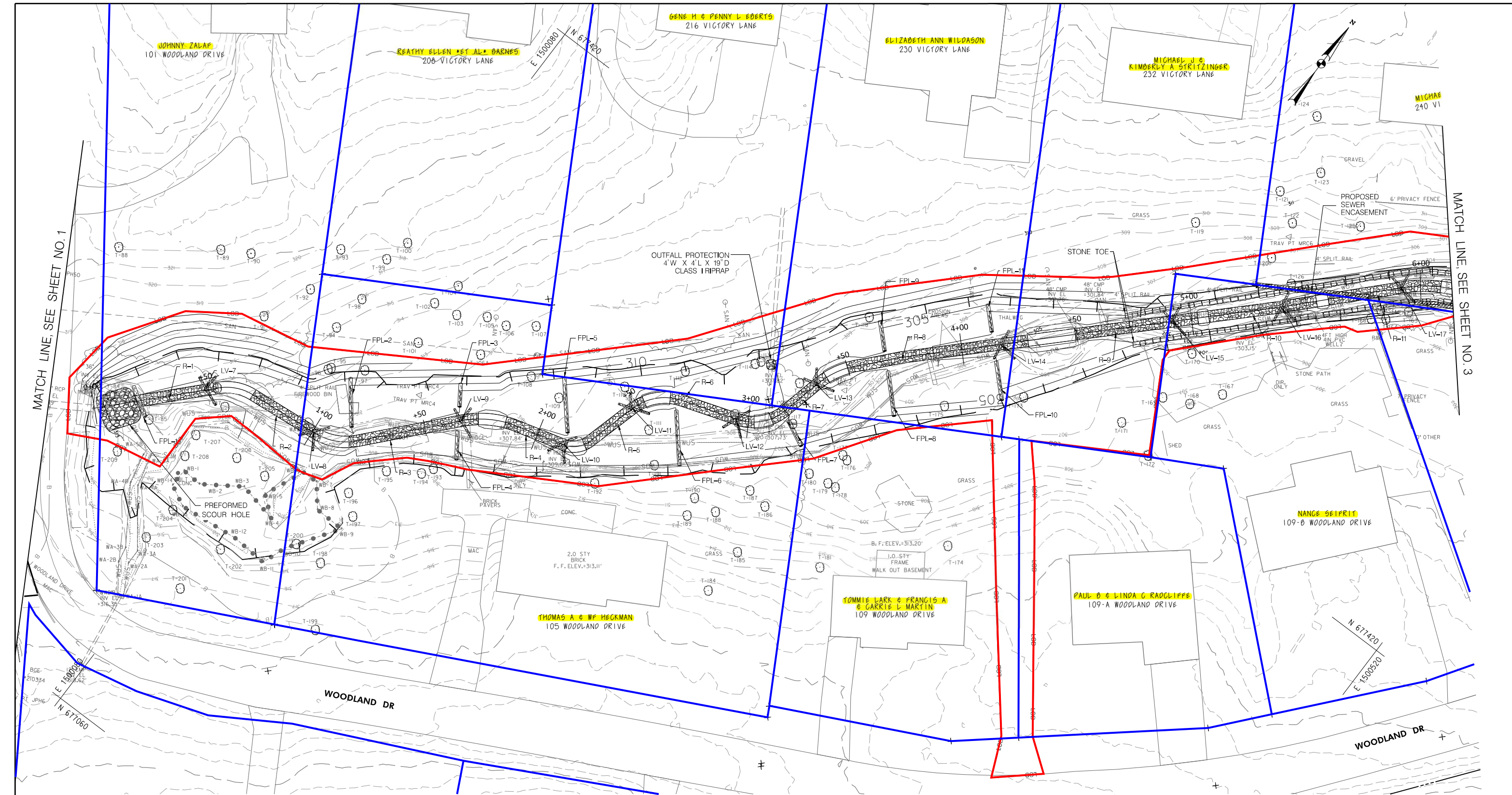
Drawn By : <u>RMQ/BEA</u>	Scale : <u>1" = 20'</u>
Designed By : <u>RMQ/BEA</u>	Date : <u>AUGUST 2021</u>
Reviewed By : <u>DMH</u>	Contract No. : <u>XX-XXXX</u>
Drawing No. <u>SR-01</u> of <u>SR-04</u>	Sheet No. <u>09</u> of <u>31</u>

ADC MAP: 21 GRID: H10

TAX MAP: 0049 GRID: 0003C

HCG BILLING ID NO.:

HCG DWG ID NO.:



LEGEND

--- SAN --- EXISTING SANITARY SEWER

• • • WETLAND BOUNDARY

— B — 25 FT WETLAND BUFFER

— WUS — WATERS OF THE US

— PRELIMINARY 100 YEAR FLOODPLAIN

— ROW/PROPERTY BOUNDARY

— ACCESS ROAD

RIFFLE GRADE CONTROL MIX

STONE TOE

FLOODPLAIN LOG

LOG VANE

PROPOSED CHANNEL

PROPOSED EXTRUDED CURB

— LOD — LIMIT OF DISTURBANCE

5' OPEN BACK COG INLET

WOODY DEBRIS

RIPRAP

PROPOSED SEWER ENCASEMENT

LEGEND:

LIMIT OF DISTURBANCE FROM CONSTRUCTION

PROPERTY LINE

NOT FOR CONSTRUCTION

RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists
www.rk.com

Responsive People | Creative Solutions

BILLING NO. XXXXXX

EG-SWMENG- XXXXXX-XXXX #XXXX

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

Revisions

No.	Description	Date
1	Initial Design	08/01/2021
2	Revised Design	08/01/2021

HARFORD COUNTY, MARYLAND

**WOODLAND RUN
STREAM RESTORATION
STREAM RESTORATION PLAN**

Drawn By : RMO/BEA

Designed By : RMO/BEA

Reviewed By : DMH

Drawing No. SR-02 of SR-04

Scale : 1" = 20'

Date : AUGUST 2021

Contract No.: XX-XXXX

Sheet No. 10 of 31

BY: roaks -

PLOTTED: 9/15/2021

FILE: \\balsrv05\w2017\117040_HARCO\Task 001_Woodland Run\CADD\plans\10_SRF-002-Woodland.dgn

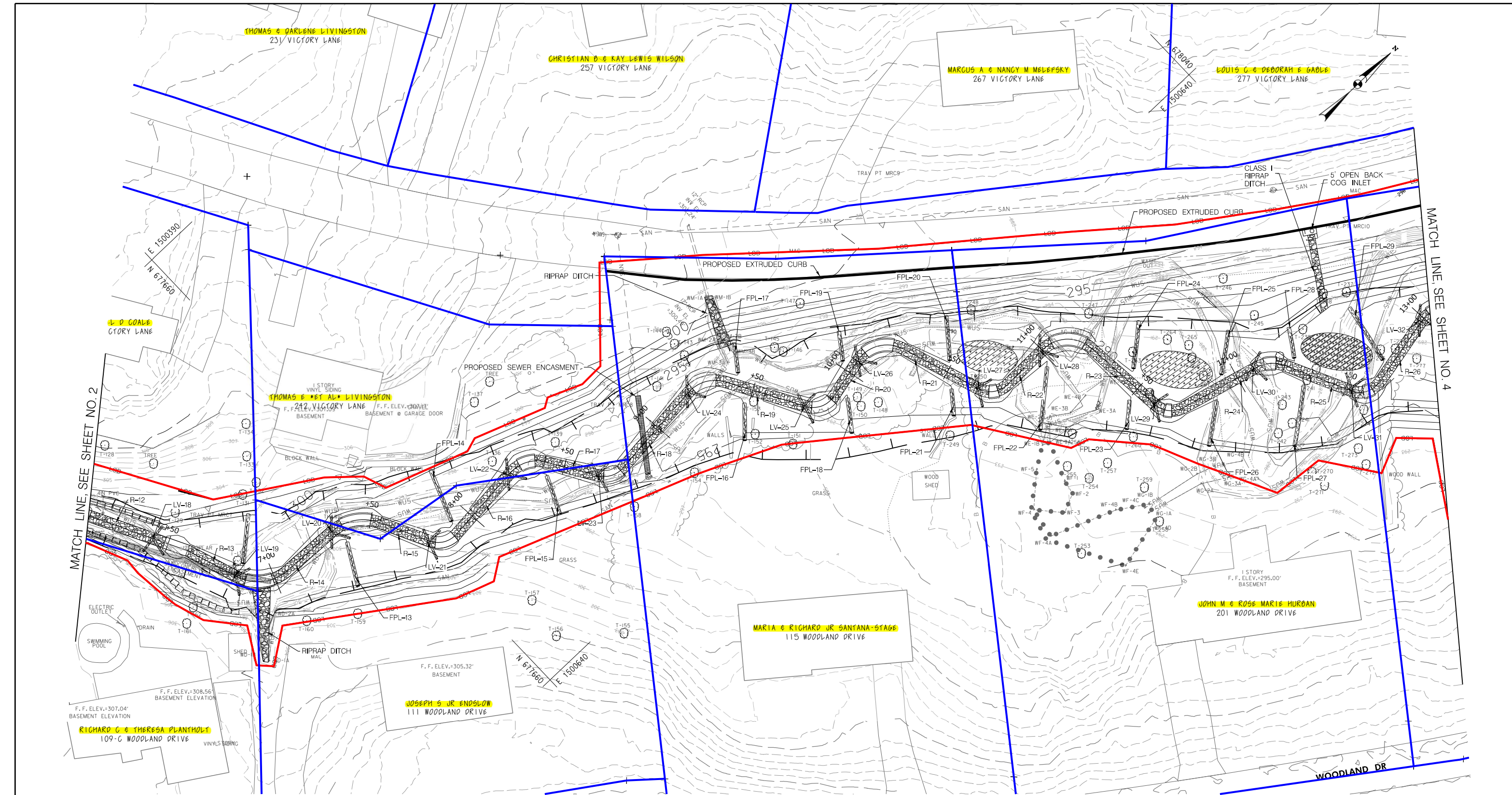
ADC MAP: 21 GRID: H10

TAX MAP: 0049 GRID: 0003C

HCG BILLING ID NO.:

HCG DWG ID NO.:

SCALE: 1" = 20'



LEGEND

— SAN —	EXISTING SANITARY SEWER		RIFFLE GRADE CONTROL MIX		5' OPEN BACK COG INLET
• • •	WETLAND BOUNDARY		STONE TOE		WOODY DEBRIS
- B -	25 FT WETLAND BUFFER		FLOODPLAIN LOG		RIPRAP
- WUS -	WATERS OF THE US		LOG VANE		PROPOSED SEWER ENCASEMENT
	PRELIMINARY 100 YEAR FLOODPLAIN		PROPOSED CHANNEL		
---	ROW/PROPERTY BOUNDARY		PROPOSED EXTRUDED CURB		
---	ACCESS ROAD		L.O.D. - LIMIT OF DISTURBANCE		

NOT FOR CONSTRUCTION

RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists
www.rk.com

Responsive People | Creative Solutions

LEGEND:

LIMIT OF DISTURBANCE FROM CONSTRUCTION ———

PROPERTY LINE ———

Revisions

BILLING NO. XXXXXX

EG-SWMENG- XXXXXX-XXXX #XXXX

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

SCALE: 1" = 20'

HARFORD COUNTY, MARYLAND

WOODLAND RUN
STREAM RESTORATION
STREAM RESTORATION PLAN

Drawn By : RMO/BEA	Scale : 1" = 20'
Designed By : RMO/BEA	Date : AUGUST 2021
Reviewed By : DMH	Contract No. : XX-XXXX
Drawing No. SR-03 of SR-04	Sheet No. 11 of 31

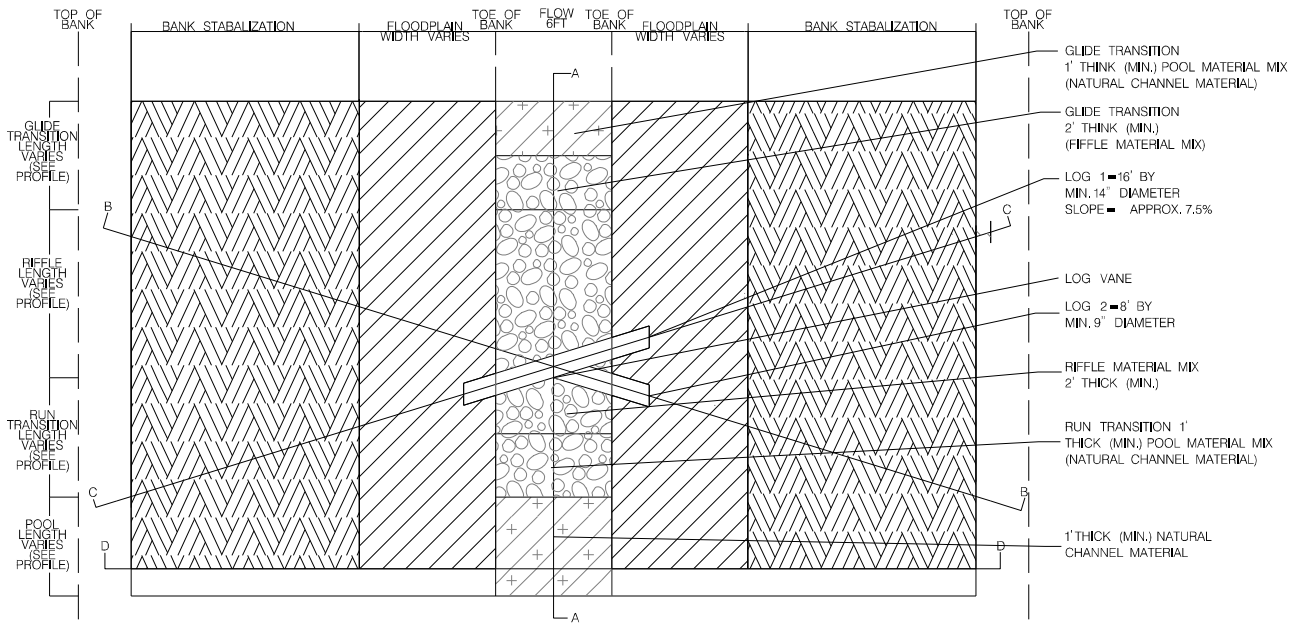
PLOTTED: 9/15/2021
FILE: \\balserv05\2017\2017\17040_HARCO\Task 001_Woodland Run\CADD\plans\11_gSR-003-Woodland.dgn

BY: roaks -

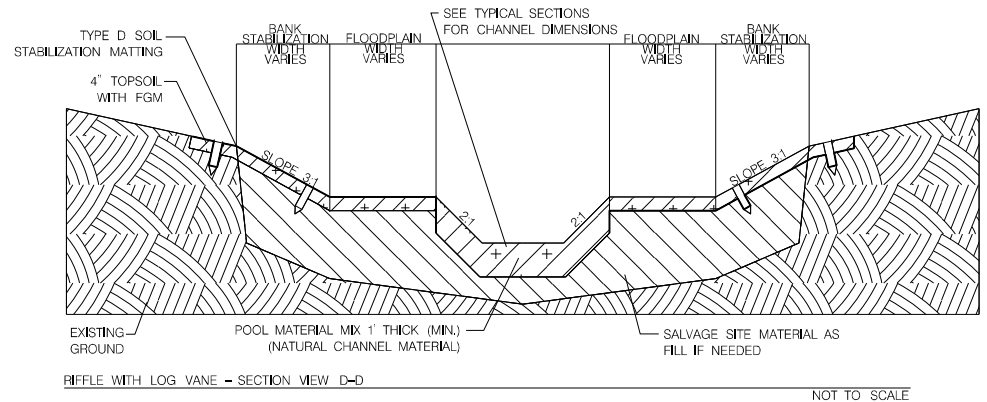
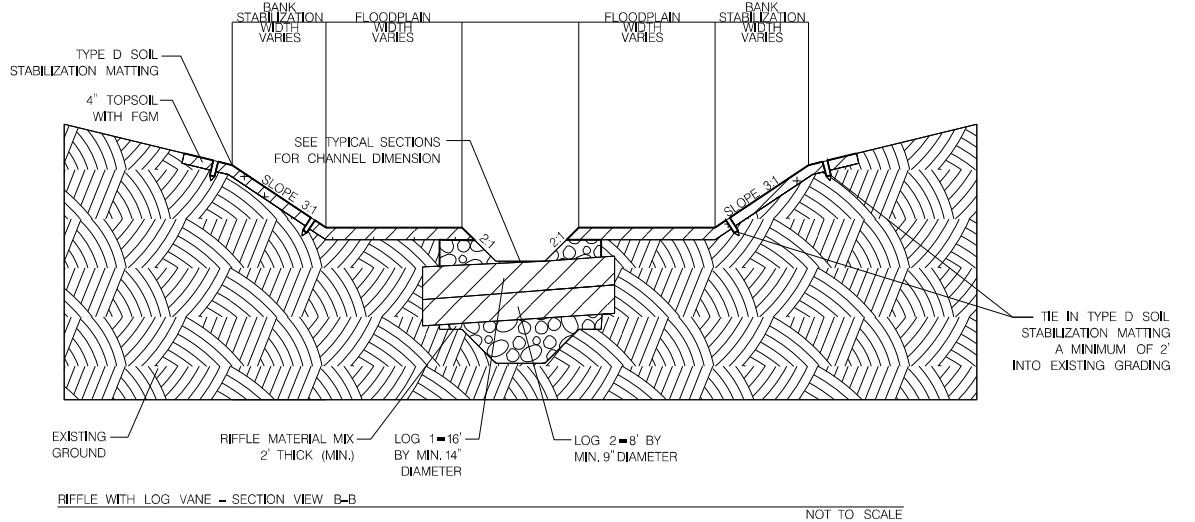
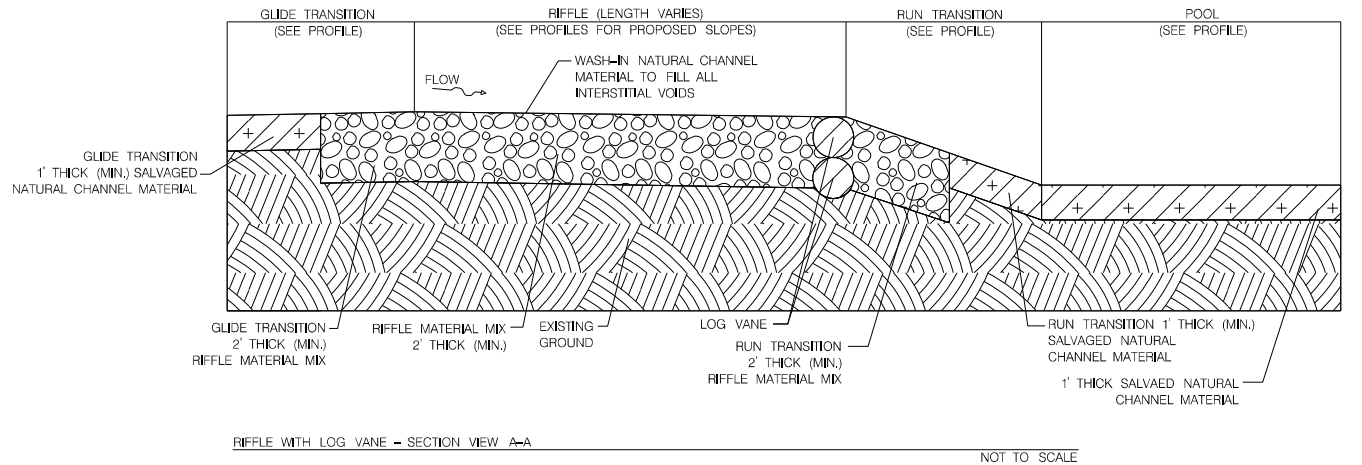
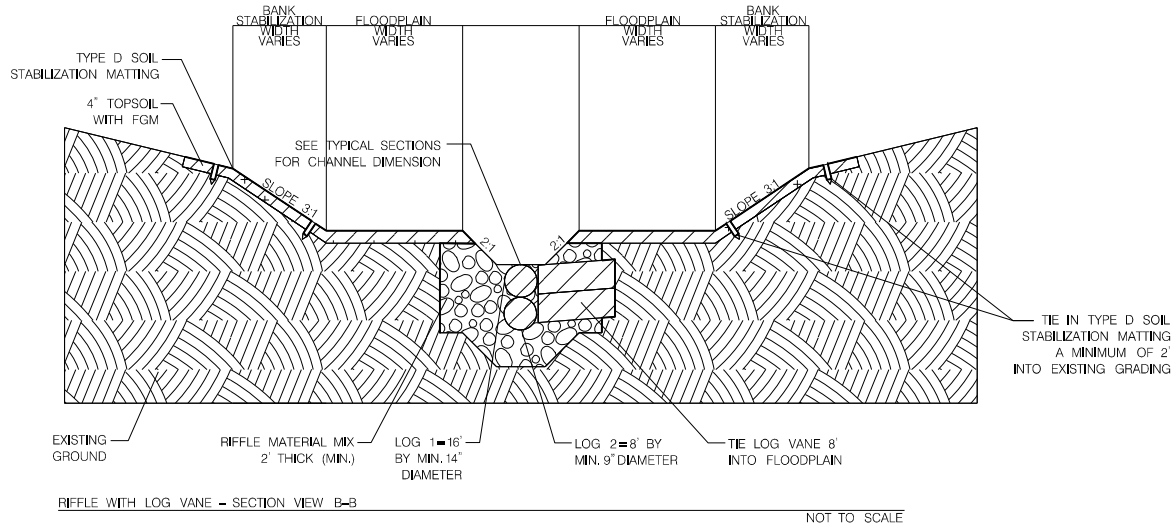
HCG BILLING ID NO.:
HCG DWG ID NO.:
TAX MAP: 0049 GRID: 0003C
ADC MAP: 21 GRID: H10

BY: roaks -

PLOTTED: 9/15/2021
 FILE: \\balsrv05\w2017\117040_HARCO\Task 001_Woodland Run\CADD\plans\113_gDE-0001-Woodland.dgn



RIFFLE WITH LOG VANE - PLAN VIEW
 NOTES:
 1. WASH NATURAL CHANNEL MATERIAL INTO RIFFLE MATERIAL MIX TO FILL ALL VOID SPACES.
 2. SEE LANDSCAPE PLANS FOR PLANTING INFORMATION.
 3. TIE LOGS INTO BANK AT DIRECTION OF ENGINEER.



NOT FOR CONSTRUCTION

RK&K
 P: 410.728.2900
 700 East Pratt Street, Suite 500 | Baltimore, MD 21202
 Engineers | Construction Managers | Planners | Scientists
 www.rk.com
 Responsive People | Creative Solutions

BILLING NO. XXXXXX
EG-SWMENG- XXXXXX-XXXX #XXXX
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

SIGN AND SEAL

Revisions

HARFORD COUNTY, MARYLAND

WOODLAND RUN
 STREAM RESTORATION
 STREAM RESTORATION DETAILS

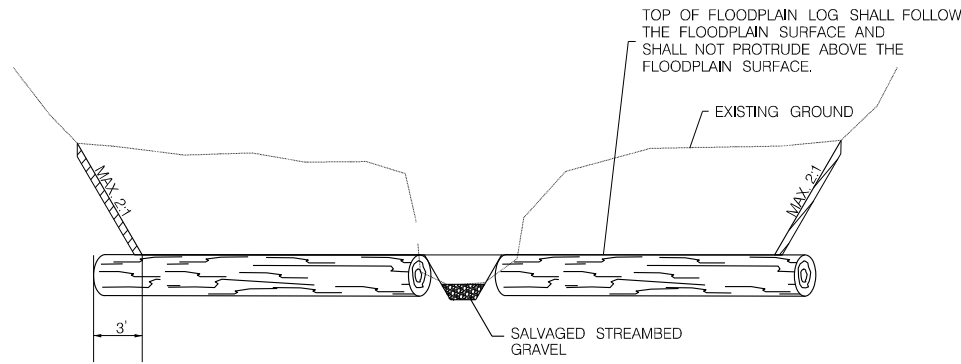
Drawn By : RMO/BEA	Scale : NOT TO SCALE
Designed By : RMO/BEA	Date : AUGUST 2021
Reviewed By : DMH	Contract No. : XX-XXXX
Drawing No. DE-01 of DE-04	Sheet No. 13 of 31

ADC MAP: 21 GRID: H10

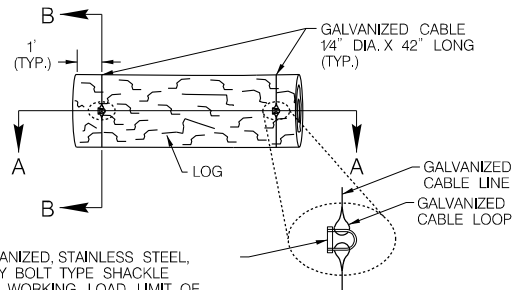
TAX MAP: 0049 GRID: 0003C

HCG BILLING ID NO.:

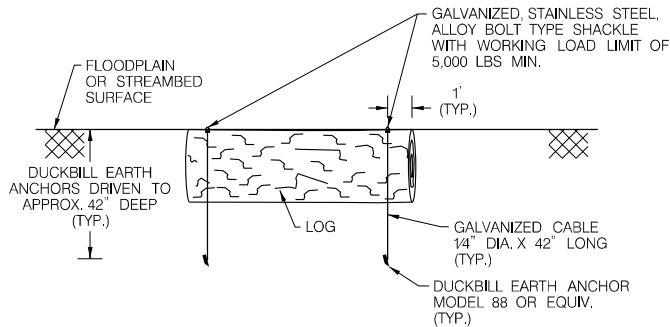
HCG DWG ID NO.:



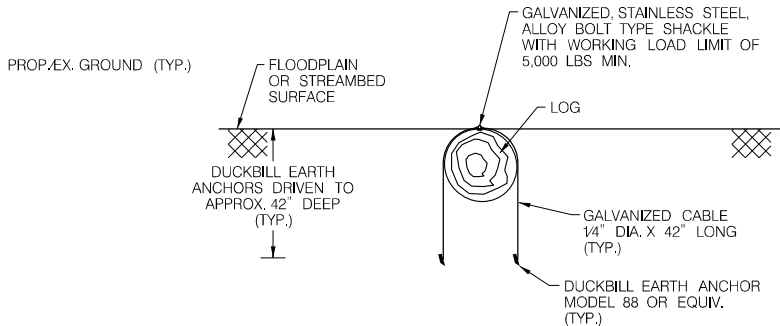
NOTE:
FOR LOG ANCHOR DETAIL, SEE F-ESD-10



PLAN VIEW



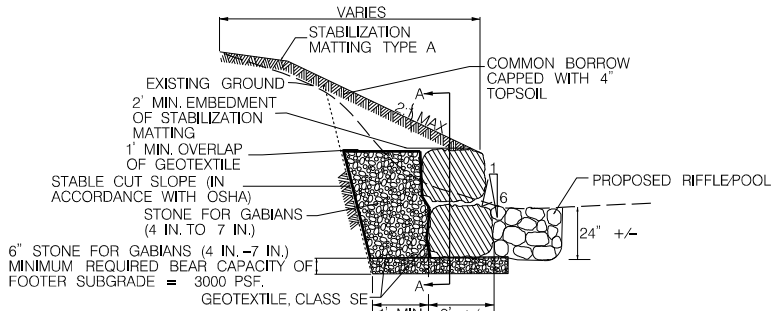
SECTION A-A



SECTION B-B

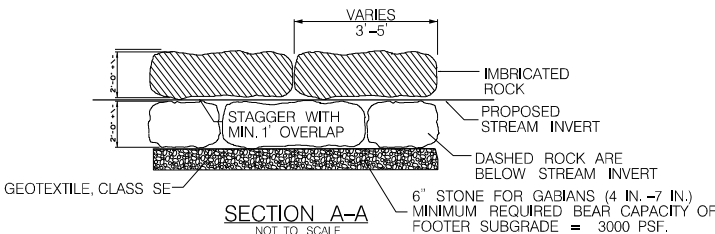
LOG ANCHOR DETAIL

NOT TO SCALE



STONE TOE SECTION

NOT TO SCALE

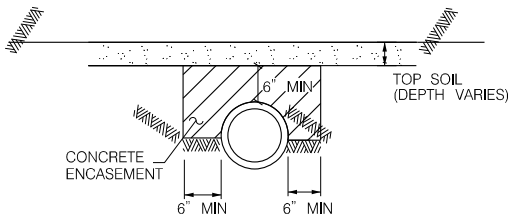


SECTION A-A

NOT TO SCALE

STONE TOE

NOT TO SCALE

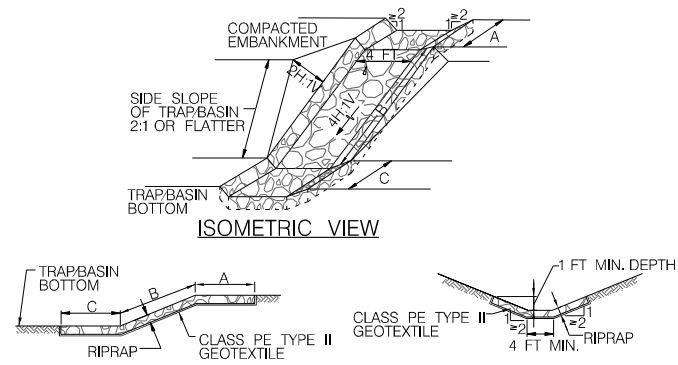


SEWER ENCASEMENT DETAIL

NOT TO SCALE

NOTES

1. CONCRETE ENCASEMENT DEPTH TO MIDPOINT PIPE.
2. CONTRACTOR SHALL ONLY EXCAVATE TRENCH TO ELEVATION OF MID-POINT OF PIPE, LOWER HALF OF PIPE SHALL NOT BE EXPOSED AND SHALL REMAIN ON IN-SITE SOIL.



RIPRAP INFLOW PROTECTION

NOT FOR
CONSTRUCTION

RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists
www.rk.com

Responsive People | Creative Solutions

BILLING NO. XXXXXX

EG-SWMENG- XXXXXX-XXXX #XXXX

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME,
AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF
THE STATE OF MARYLAND, LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

SIGN AND SEAL

Revisions

HARFORD COUNTY, MARYLAND

WOODLAND RUN
STREAM RESTORATION
STREAM RESTORATION DETAILS

Drawn By : RMO/BEA

Scale : NOT TO SCALE

Designed By : RMO/BEA

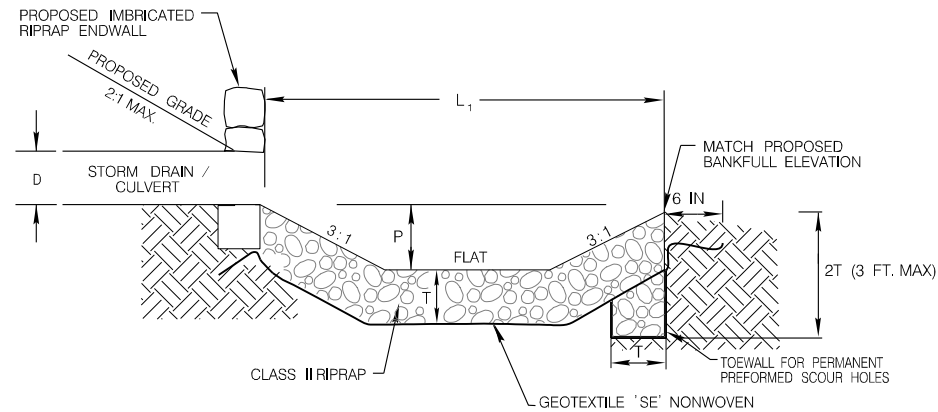
Date : AUGUST 2021

Reviewed By : DMH

Contract No.: XX-XXXX

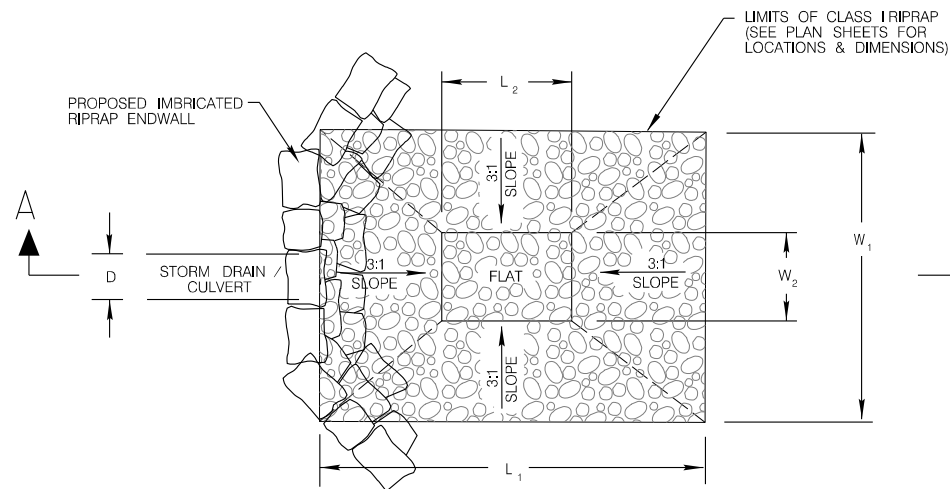
Drawing No. DE-02 of DE-04

Sheet No. 14 of 31



*NOTE: T (STONE THICKNESS) = 2 X D50 (MEDIAN DIAMETER OF RIPRAP)

SECTION A-A

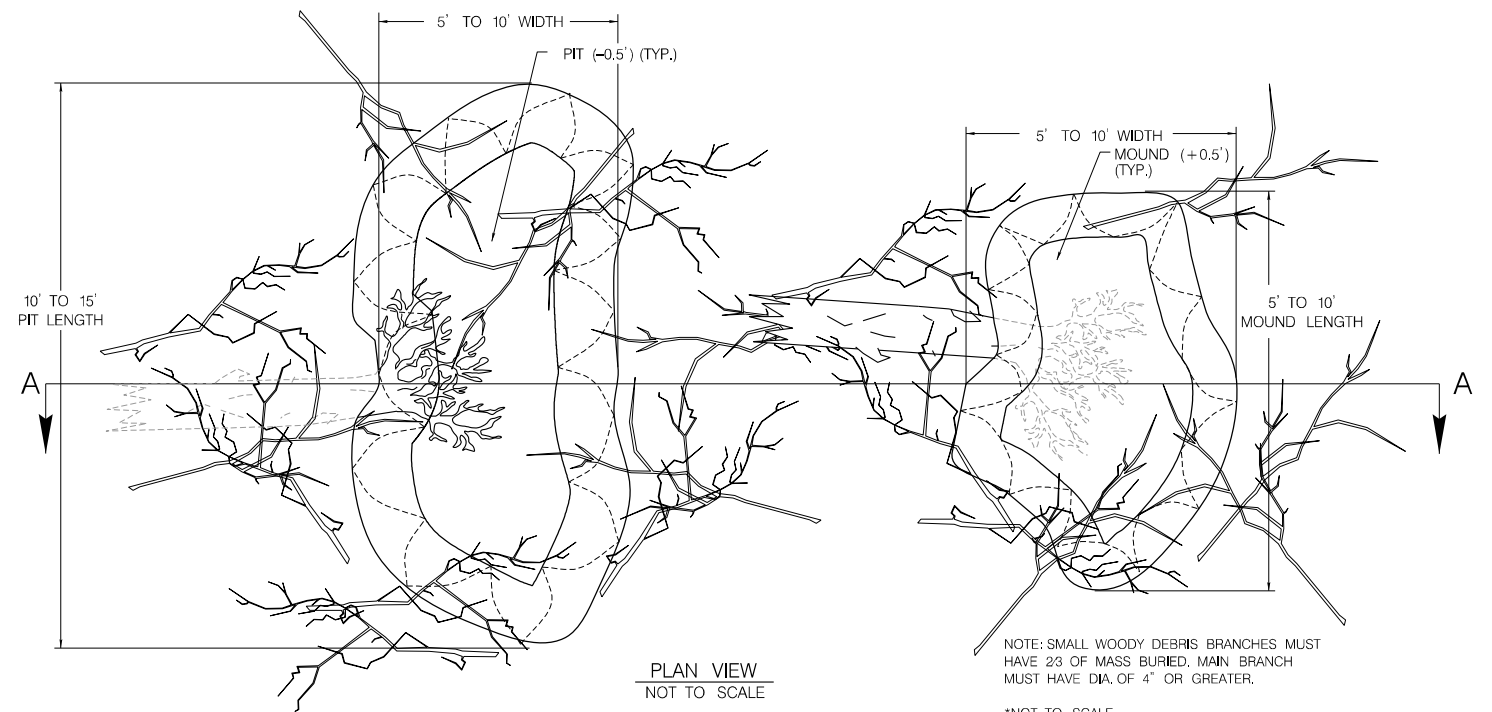


PLAN VIEW

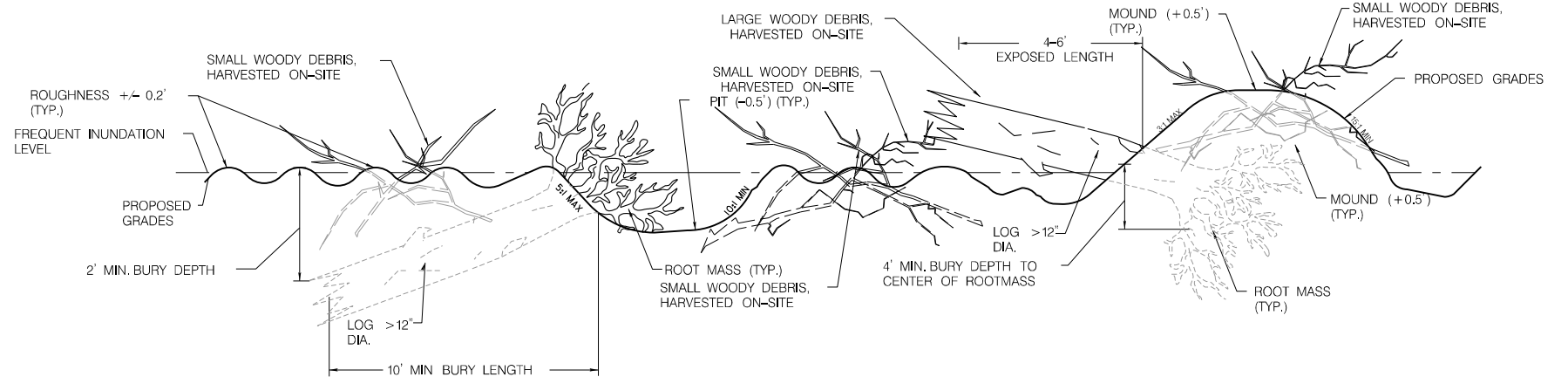
PREFORMED SCOUR HOLE CONSTRUCTION DETAILS
NOT TO SCALE

PREFORMED SCOUR HOLE DIMENSION TABLE

D (IN.)	L ₁ (FT.)	L ₂ (FT.)	W ₁ (FT.)	W ₂ (FT.)	P (FT.)	D50 (IN.)	T (IN.)
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-



PLAN VIEW
NOT TO SCALE



SECTION A-A
NOT TO SCALE
WOODY DEBRIS PLACEMENT DETAIL
NOT TO SCALE

HARFORD COUNTY, MARYLAND

WOODLAND RUN STREAM RESTORATION STREAM RESTORATION DETAILS

Drawn By : <u> RMO/BEA </u>	Scale : <u> NOT TO SCALE </u>
Designed By : <u> RMO/BEA </u>	Date : <u> AUGUST 2021 </u>
Reviewed By : <u> DMH </u>	Contract No. : <u> XX-XXXX </u>
Drawing No. <u> DE-03 </u> of <u> DE-04 </u>	Sheet No. <u> 15 </u> of <u> 31 </u>

NOT FOR
CONSTRUCTION

RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists
www.rk.com

Responsive People | Creative Solutions

PROFESSIONAL CERTIFICATION

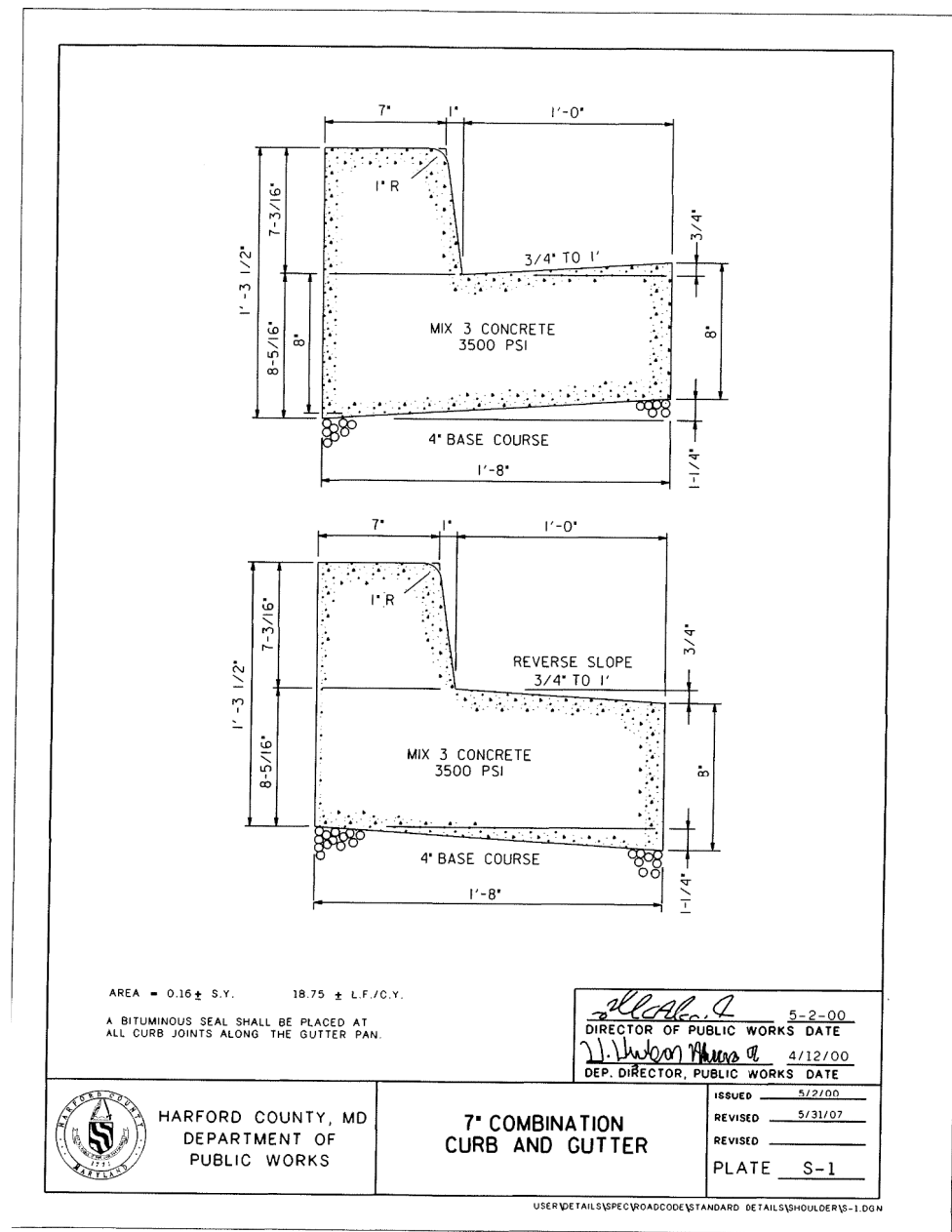
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME,
AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF
THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

SIGN AND SEAL

Revisions

BY: roaks -

PLOTTED: 9/15/2021
FILE: \\balsrv05\w2017\017\17040_HARCO\Task 001_Woodland Run\CADD\plans\16_gDE-004-Woodland.dgn



3-1.DGN 02/13/2009 10:30:53 AM

NOT FOR
CONSTRUCTION

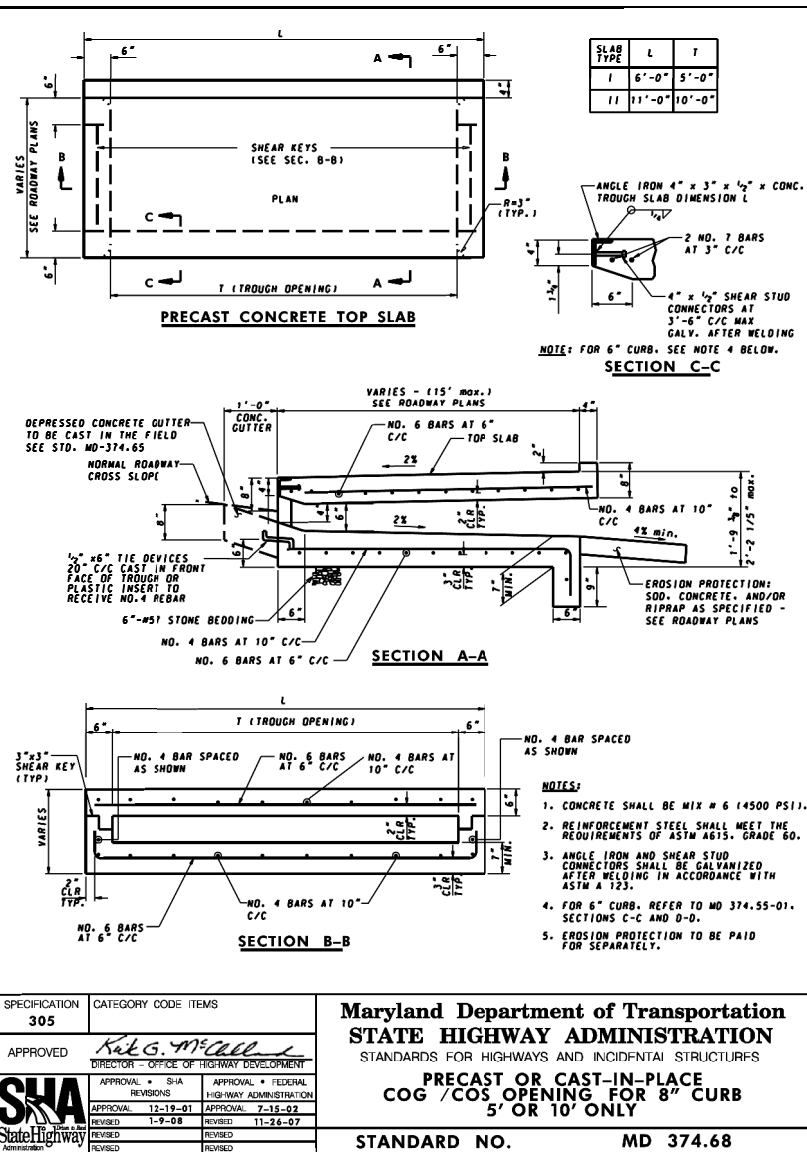
RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202
Engineers | Construction Managers | Planners | Scientists
www.rk.com
Responsive People | Creative Solutions

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME,
AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF
THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

SIGN AND SEAL



HARFORD COUNTY, MARYLAND

WOODLAND RUN
STREAM RESTORATION
STREAM RESTORATION DETAILS

Drawn By : RMO/BEA
Designed By : RMO/BEA
Reviewed By : DMH
Drawing No. DE-04 of DE-04

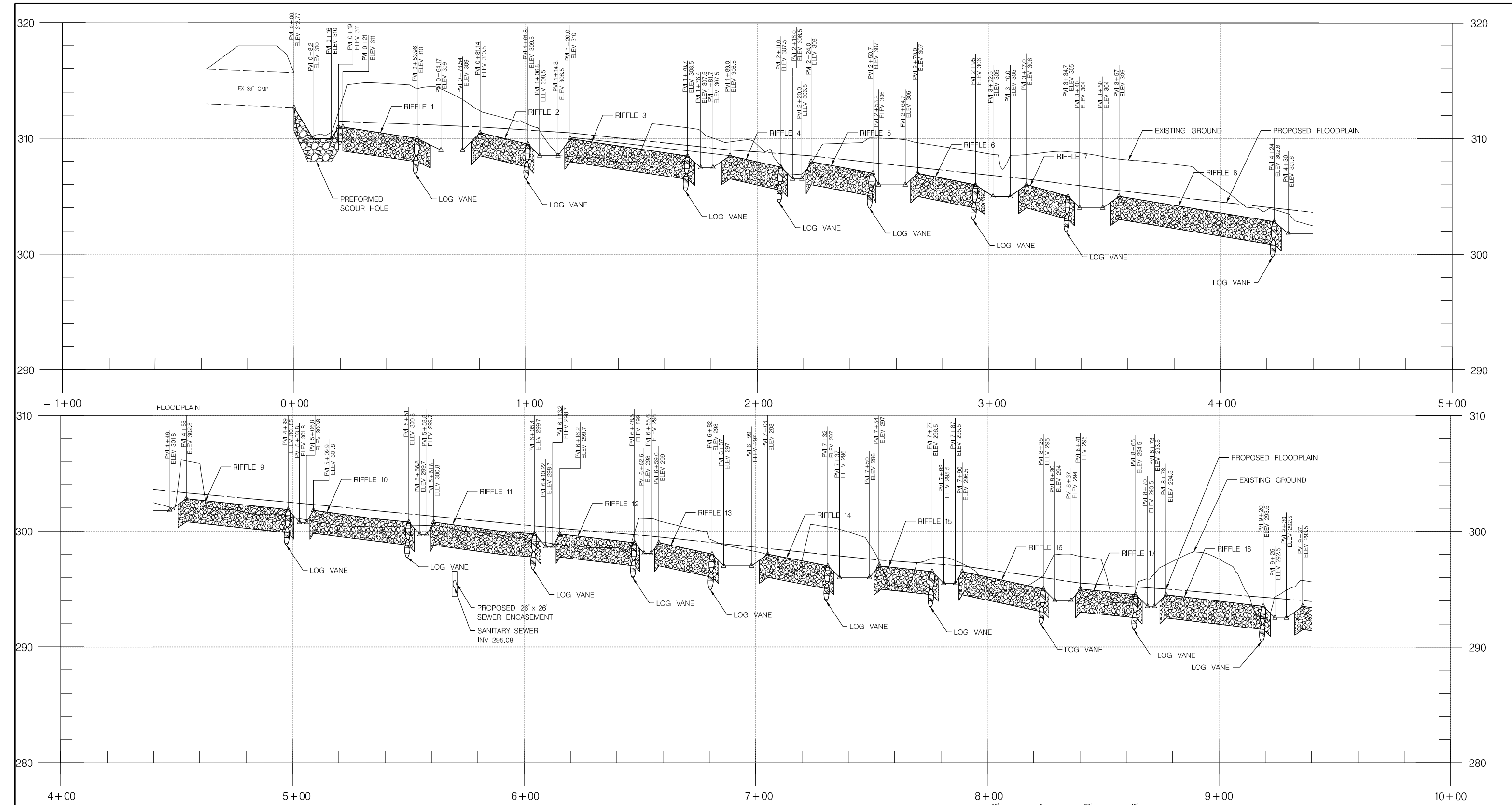
Scale : NOT TO SCALE
Date : AUGUST 2021
Contract No. : XX-XXXX
Sheet No. 16 of 31

ADC MAP: 21 GRID: H10

TAX MAP: 0049 GRID: 0003C

HCG BILLING ID NO.:

HCG DWG ID No.:



BY: roaks -

PLOTTED: 9/15/2021
FILE: \\balserv05\w2017\1717040_HARCO\Task 001_Woodland Run\CADD\plans\17_gPR-001-Woodland.dgn

NOT FOR
CONSTRUCTION



P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202
Engineers | Construction Managers | Planners | Scientists
www.rk&k.com
Responsive People | Creative Solutions

BILLING NO. XXXXXX
EG-SWMENG- XXXXXX-XXXX #XXXX
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

SIGN AND SEAL

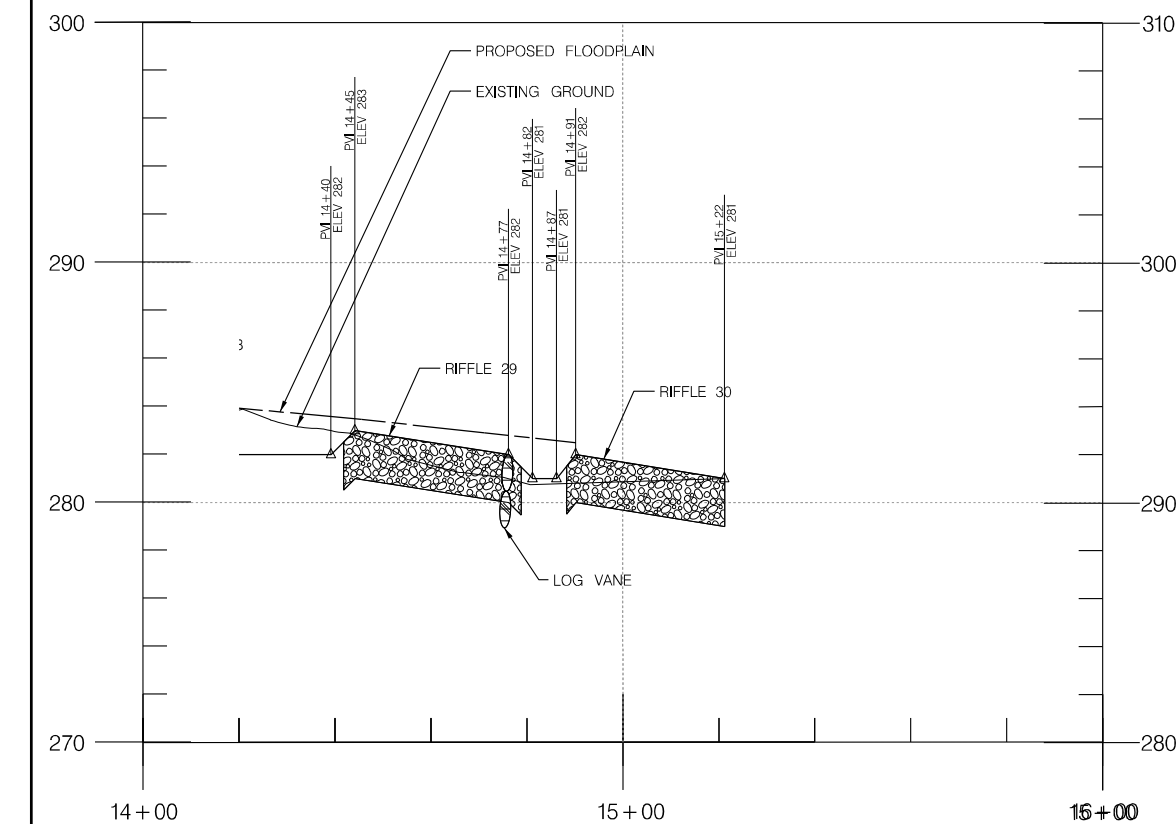
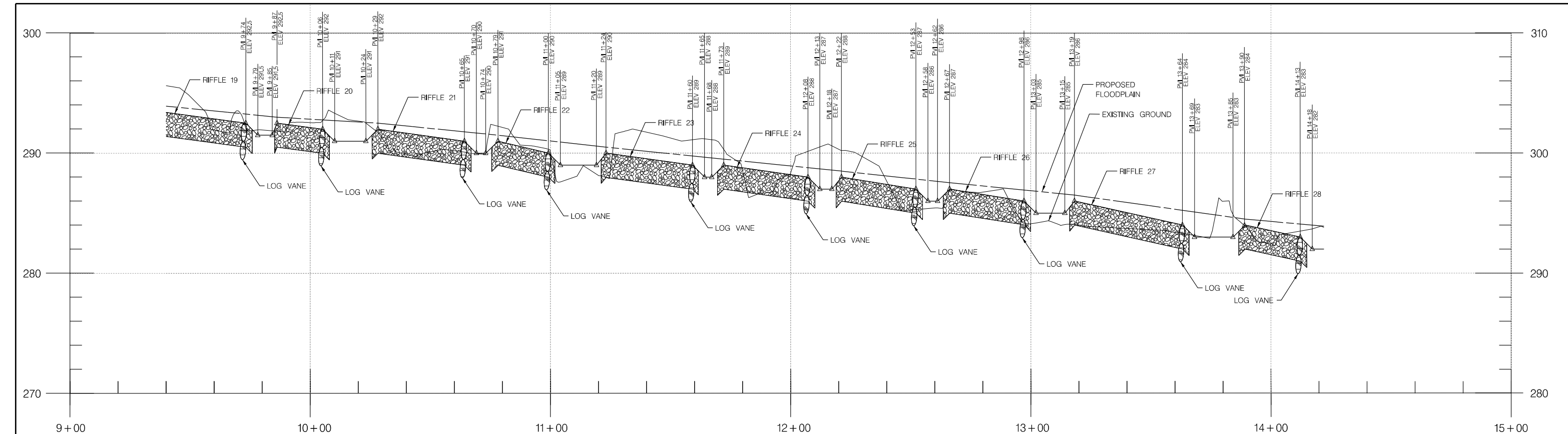
Revisions

HARFORD COUNTY, MARYLAND

WOODLAND RUN STREAM RESTORATION STREAM PROFILE

Drawn By : <u> RMO/BEA </u>	Scale : <u> H:1"=20' V:1"=4' </u>
Designed By : <u> RMO/BEA </u>	Date : <u> AUGUST 2021 </u>
Reviewed By : <u> DMH </u>	Contract No.: <u> XX-XXXX </u>
Drawing No. <u> PR-01 </u> of <u> PR-02 </u>	Sheet No. <u> 17 </u> of <u> 31 </u>

TAX MAP: 0049 GRID: 0003C ADC MAP: 21 GRID: H10 HCG BILLING ID NO.: HCG DWG ID NO.: SCALE: 1"=20'



NOT FOR
CONSTRUCTION

RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists
www.rk&k.com

Responsive People | Creative Solutions

PROFESSIONAL CERTIFICATION

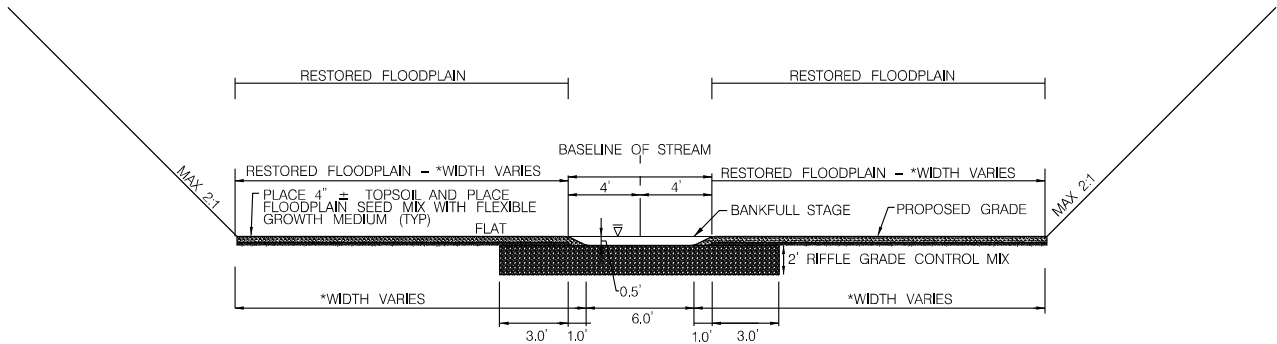
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME,
AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF
THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

SIGN AND SEAL

PR-2	
Revisions	

HARFORD COUNTY, MARYLAND			
WOODLAND RUN STREAM RESTORATION STREAM PROFILE			
Drawn By : <u> RMO/BEA </u>	Scale : <u> H:1" = 20' V:1" = 4' </u>		
Designed By : <u> RMO/BEA </u>	Date : <u> AUGUST 2021 </u>		
Reviewed By : <u> DMH </u>	Contract No. : <u> XX-XXXX </u>		
Drawing No. <u> PR-02 </u>	of <u> PR-02 </u>	Sheet No. <u> 18 </u>	of <u> 31 </u>

BY: roaks -

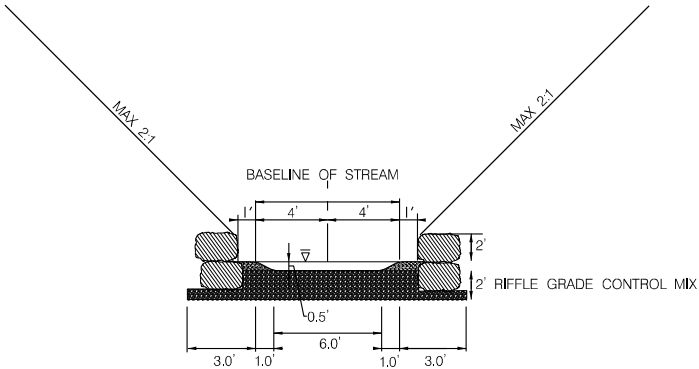


* SEE PLAN FOR LOCATIONS AND VARYING FLOODPLAIN AND CHANNEL WIDTHS

TYPICAL RIFFLE STREAM SECTION

NOT TO SCALE

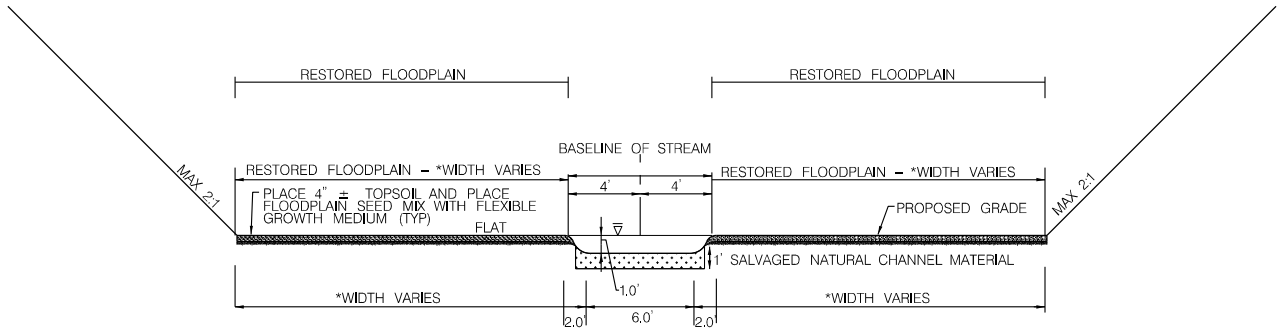
- 1.THE RIFFLE GRADE CONTROL STABILITY MIX SHALL BE PLACED SO IT SHINGLES IN A DOWNSTREAM DIRECTION, SMALL AND LARGE STONES MUST BE MIXED TO MINIMIZE VOID SPACE AND PROMOTE INTERLOCKING. NATURAL CHANNEL BED MATERIAL SHALL BE WASHIED INTO THE MIX TO ENSURE ALL INTERSTITIAL VOIDS ARE FILLED AND SUBSURFACE FLOW IS ACHIEVED. DUMPING OF STONE WILL NOT BE PERMITTED
2. SEE CROSS SECTIONS FOR WIDTH AND TIE-IN ELEVATIONS OF RIFFLE BANK TRANSITIONS



TYPICAL RIFFLE WITH STONE TOE SECTION

NOT TO SCALE

- 1.THE RIFFLE GRADE CONTROL STABILITY MIX SHALL BE PLACED SO IT SHINGLES IN A DOWNSTREAM DIRECTION, SMALL AND LARGE STONES MUST BE MIXED TO MINIMIZE VOID SPACE AND PROMOTE INTERLOCKING. NATURAL CHANNEL BED MATERIAL SHALL BE WASHIED INTO THE MIX TO ENSURE ALL INTERSTITIAL VOIDS ARE FILLED AND SUBSURFACE FLOW IS ACHIEVED. DUMPING OF STONE WILL NOT BE PERMITTED
2. SEE CROSS SECTIONS FOR WIDTH AND TIE-IN ELEVATIONS OF RIFFLE BANK TRANSITIONS

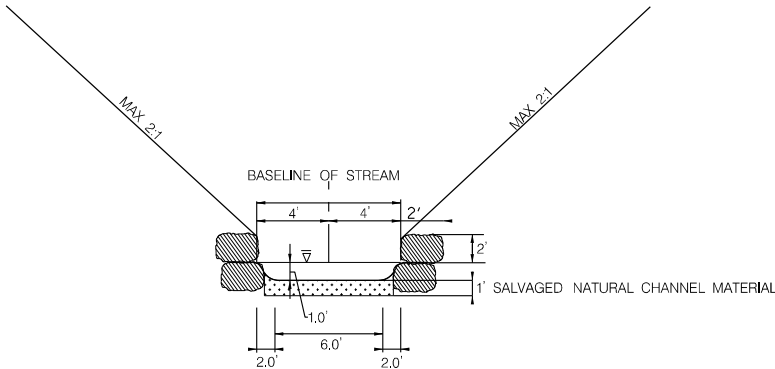


* SEE PLAN FOR LOCATIONS AND VARYING FLOODPLAIN AND CHANNEL WIDTHS

TYPICAL POOL STREAM SECTION

NOT TO SCALE

- 1.THE RIFFLE GRADE CONTROL STABILITY MIX SHALL BE PLACED SO IT SHINGLES IN A DOWNSTREAM DIRECTION, SMALL AND LARGE STONES MUST BE MIXED TO MINIMIZE VOID SPACE AND PROMOTE INTERLOCKING. NATURAL CHANNEL BED MATERIAL SHALL BE WASHIED INTO THE MIX TO ENSURE ALL INTERSTITIAL VOIDS ARE FILLED AND SUBSURFACE FLOW IS ACHIEVED. DUMPING OF STONE WILL NOT BE PERMITTED
2. SEE CROSS SECTIONS FOR WIDTH AND TIE-IN ELEVATIONS OF RIFFLE BANK TRANSITIONS



TYPICAL POOL WITH STONE TOE SECTION

NOT TO SCALE

NOT FOR
CONSTRUCTION

RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists
www.rk.com

Responsive People | Creative Solutions

BILLING NO. XXXXXX

EG-SWMENG- XXXXXX-XXXX #XXXX

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

SIGN AND SEAL

TS-1
Revisions

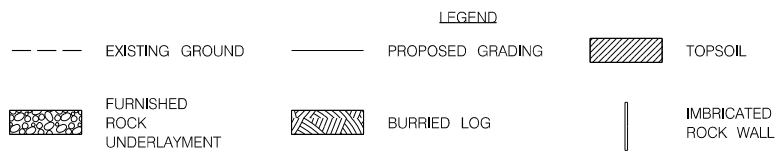
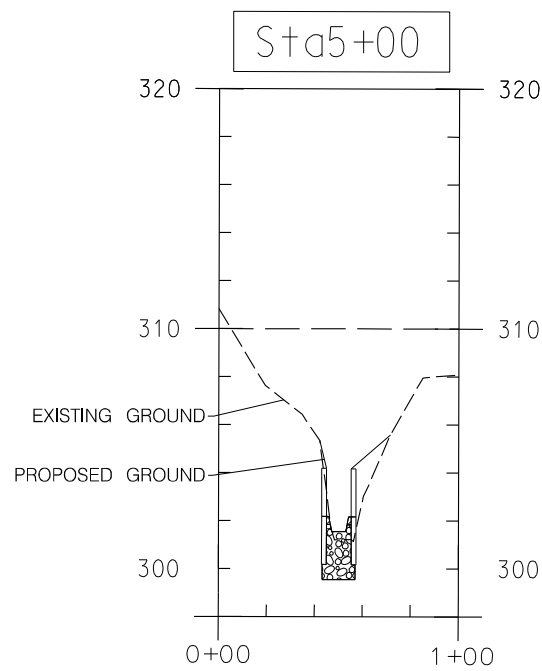
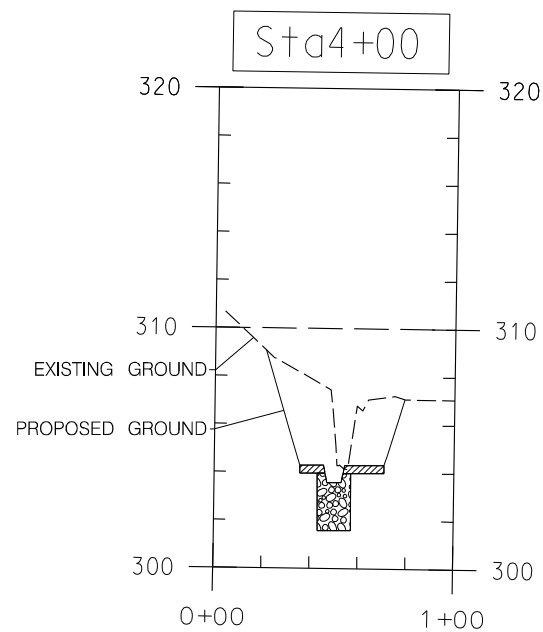
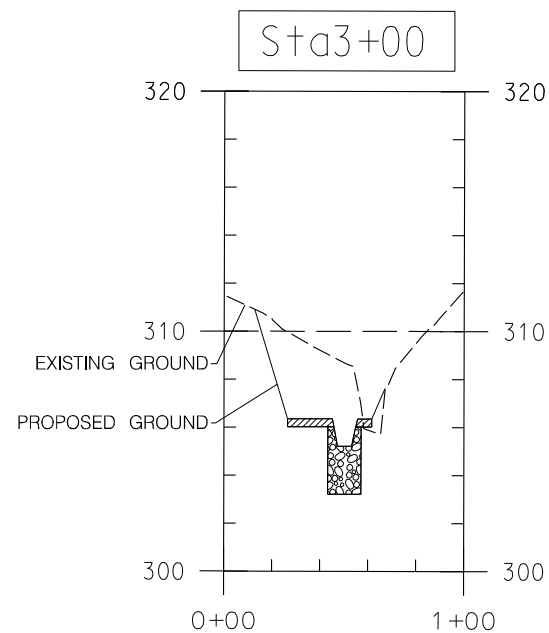
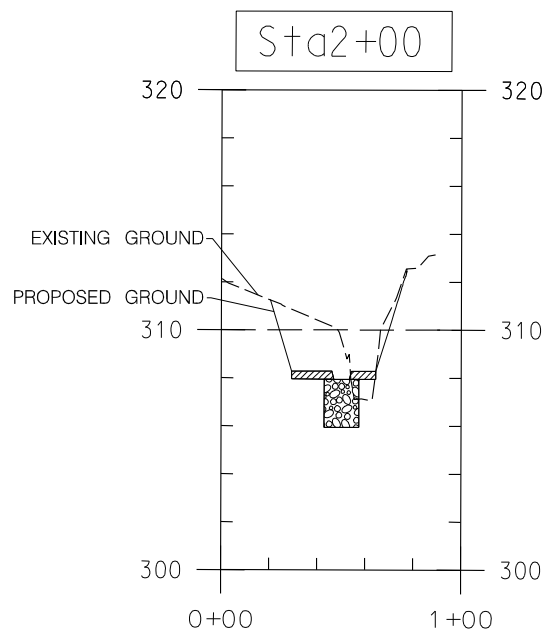
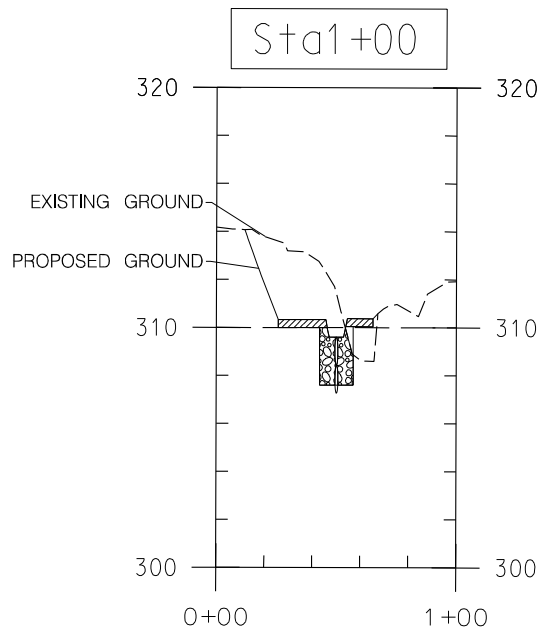
HARFORD COUNTY, MARYLAND

WOODLAND RUN
STREAM RESTORATION
TYPICAL SECTIONS

Drawn By : <u> RMO/BEA </u>	Scale : <u> NOT TO SCALE </u>
Designed By : <u> RMO/BEA </u>	Date : <u> AUGUST 2021 </u>
Reviewed By : <u> DMH </u>	Contract No. : <u> XX-XXXX </u>
Drawing No. <u> TS-01 </u> of <u> TS-01 </u>	Sheet No. <u> 19 </u> of <u> 31 </u>

BY: roaks -

BY: roaks -



RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists
www.rk.com

Responsive People | Creative Solutions

BILLING NO. XXXXXX

EG-SWMENG- XXXXXX-XXXX #XXXX

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME,
AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF
THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

SIGN AND SEAL

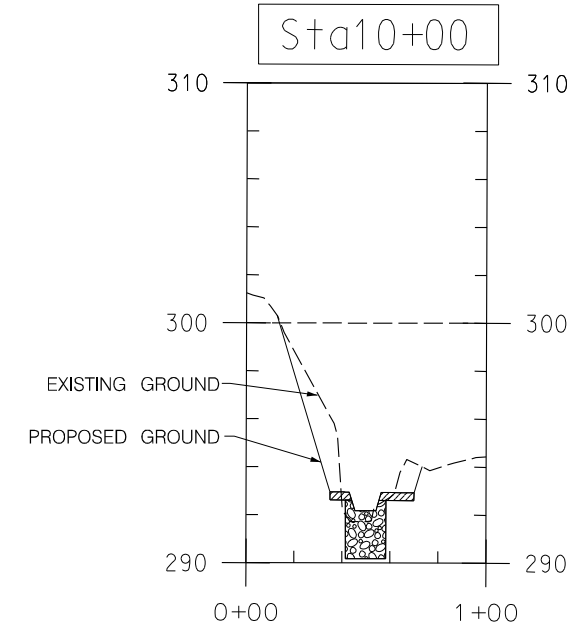
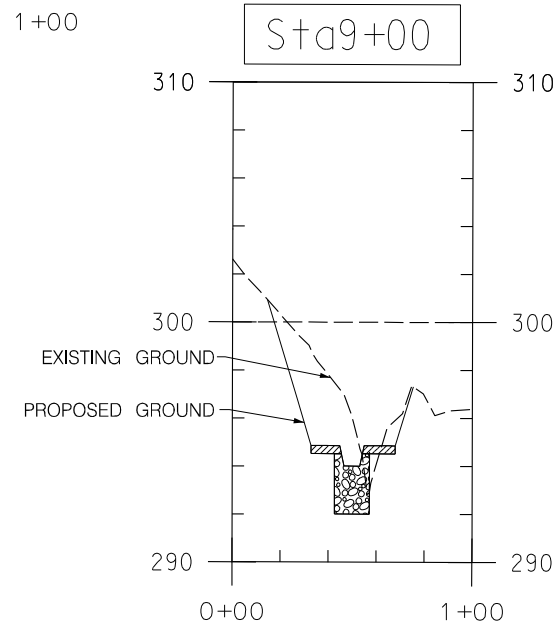
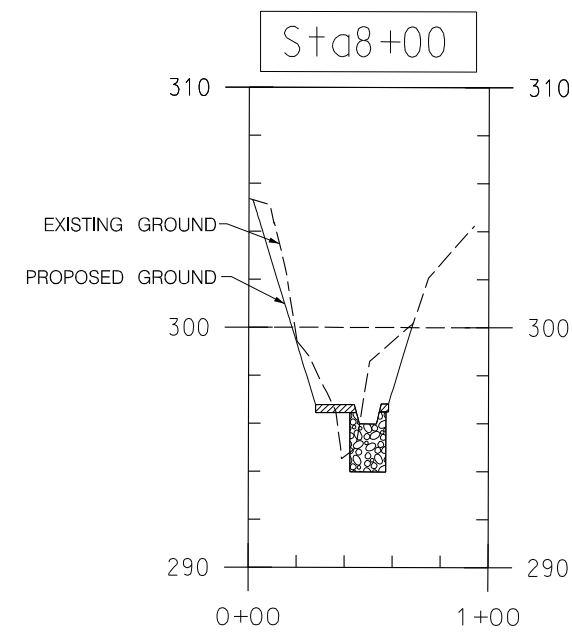
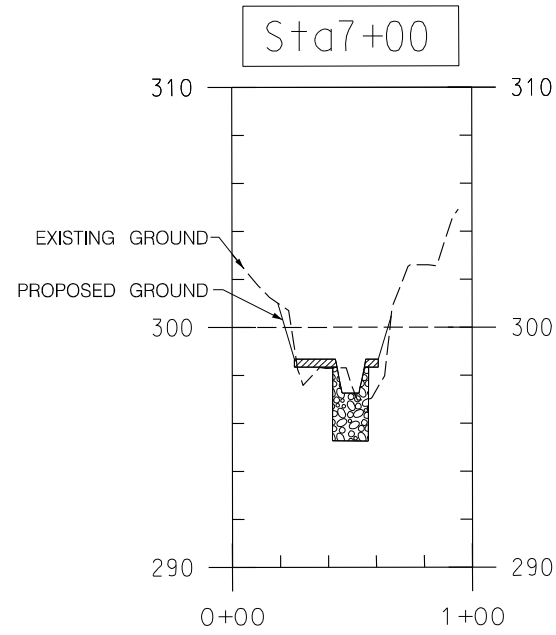
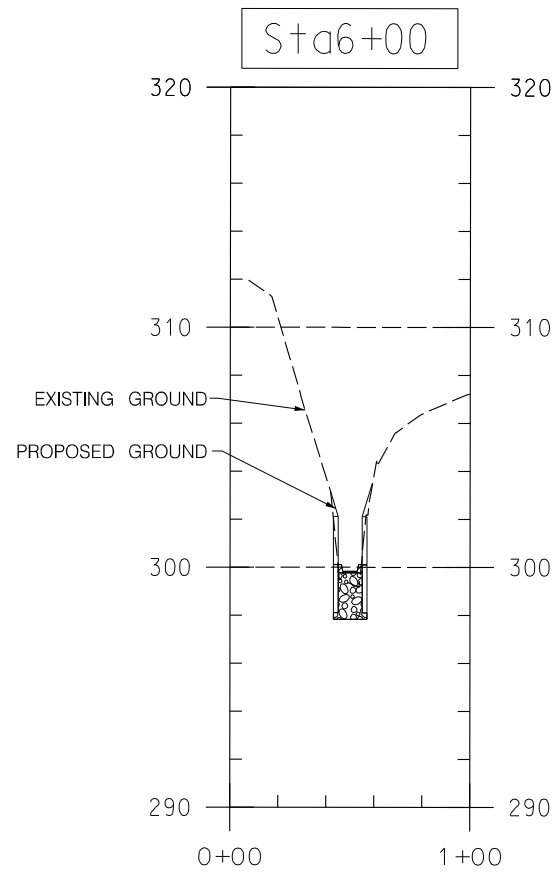
Revisions

HARFORD COUNTY, MARYLAND

WOODLAND RUN
STREAM RESTORATION
STREAM CROSS SECTIONS

Drawn By : <u> RMO/BEA </u>	Scale : <u> NOT TO SCALE </u>
Designed By : <u> RMO/BEA </u>	Date : <u> AUGUST 2021 </u>
Reviewed By : <u> DMH </u>	Contract No. : <u> XX-XXXX </u>
Drawing No. <u> XS-01 </u> of <u> XS-03 </u>	Sheet No. <u> 20 </u> of <u> 31 </u>

BY: roaks -



LEGEND

--- EXISTING GROUND — PROPOSED GRADING TOPSOIL

FURNISHED ROCK UNDERLAYMENT BURIED LOG IMBRICATED ROCK WALL

RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists
www.rk.com

Responsive People | Creative Solutions

BILLING NO. XXXXXX

EG-SWMENG- XXXXXX-XXXX #XXXX

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

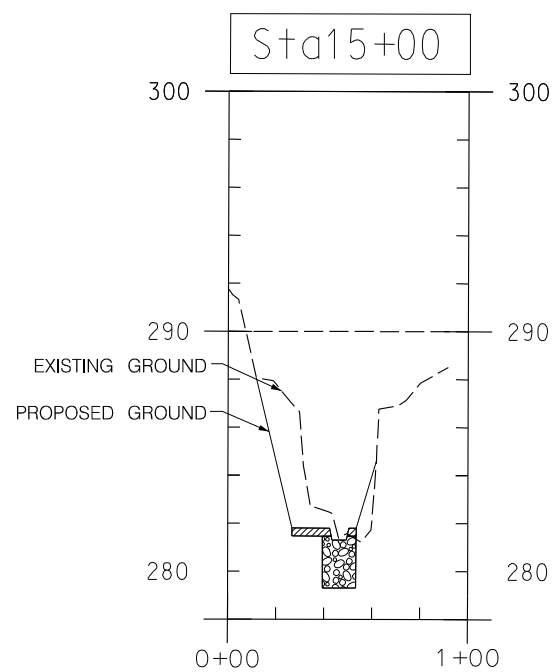
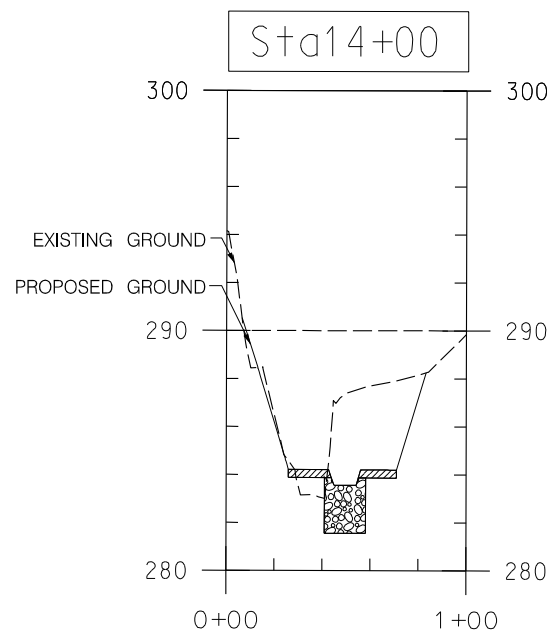
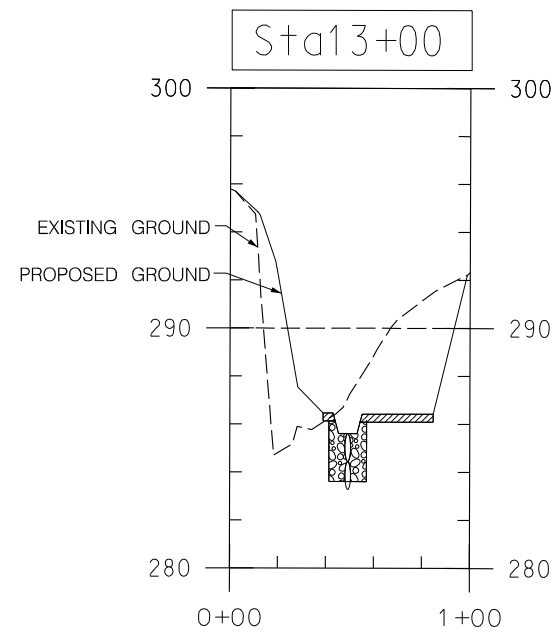
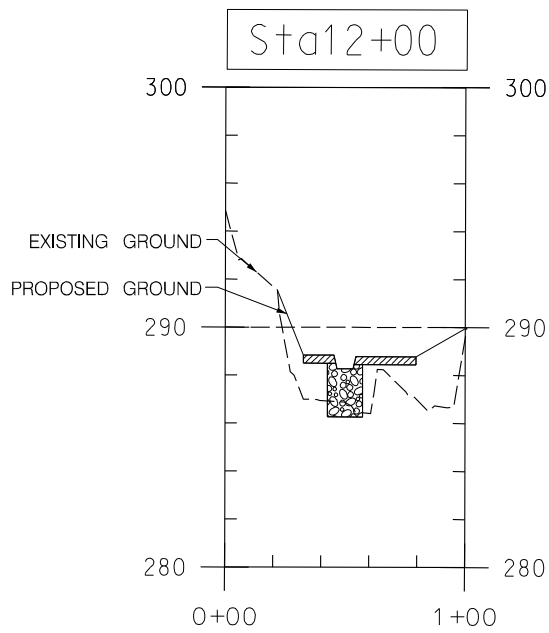
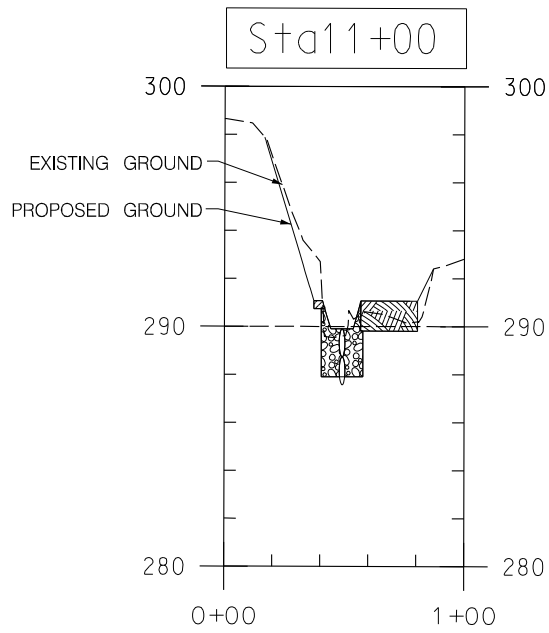
SIGN AND SEAL

Revisions

HARFORD COUNTY, MARYLAND

WOODLAND RUN
STREAM RESTORATION
STREAM CROSS SECTIONS

Drawn By : <u> RMO/BEA </u>	Scale : <u> NOT TO SCALE </u>
Designed By : <u> RMO/BEA </u>	Date : <u> AUGUST 2021 </u>
Reviewed By : <u> DMH </u>	Contract No. : <u> XX-XXXX </u>
Drawing No. <u> XS-02 </u> of <u> XS-03 </u>	Sheet No. <u> 21 </u> of <u> 31 </u>



LEGEND

--- EXISTING GROUND — PROPOSED GRADING TOPSOIL

FURNISHED ROCK UNDERLAYMENT BURIED LOG

RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists
www.rk.com

Responsive People | Creative Solutions

BILLING NO. XXXXXX

EG-SWMENG- XXXXXX-XXXX #XXXX

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

SIGN AND SEAL

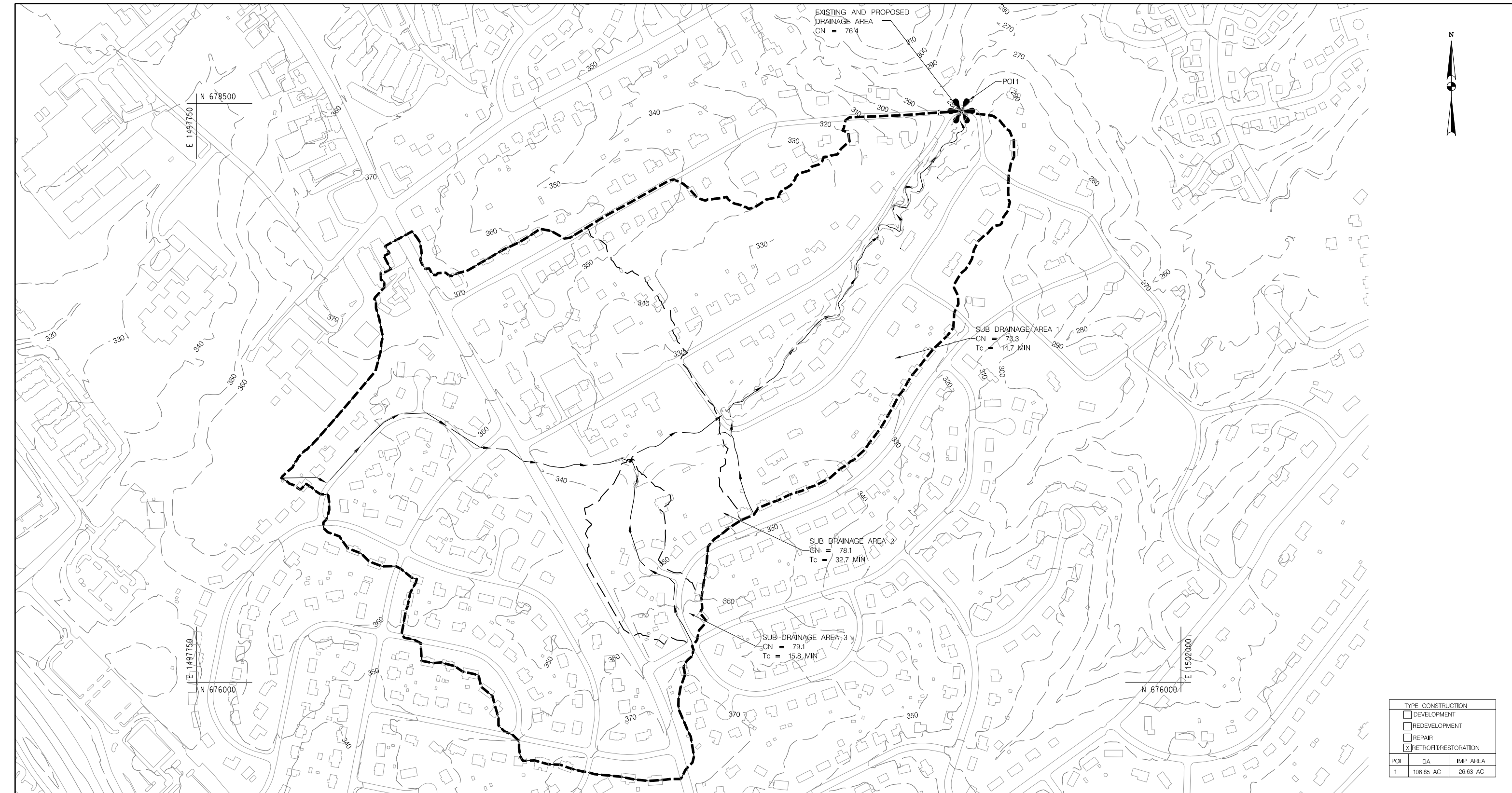
Revisions

HARFORD COUNTY, MARYLAND

WOODLAND RUN
STREAM RESTORATION
STREAM CROSS SECTIONS

Drawn By : <u> RMO/BEA </u>	Scale : <u> NOT TO SCALE </u>
Designed By : <u> RMO/BEA </u>	Date : <u> AUGUST 2021 </u>
Reviewed By : <u> DMH </u>	Contract No. : <u> XX-XXXX </u>
Drawing No. <u> XS-03 </u> of <u> XS-03 </u>	Sheet No. <u> 22 </u> of <u> 31 </u>

BY: roaks -



LEGEND

DRAINAGE AREA
SUB DRAINAGE AREA
Tc PATH
MAJOR CONTOUR
BUILDING
ROAD

NOT FOR
CONSTRUCTION

RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists
www.rk.com

Responsive People | Creative Solutions

BILLING NO. XXXXXX

EG-SWMENG- XXXXXX-XXXX #XXXX

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME,
AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF
THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

SIGN AND SEAL

Revisions

HARFORD COUNTY, MARYLAND

WOODLAND RUN
STREAM RESTORATION
DRAINAGE AREA MAP

Drawn By : RMO/BEA

Designed By : RMO/BEA

Reviewed By : DMH

Scale : 1" = 200'

Date : AUGUST 2021

Contract No. : XX-XXXX

Drawing No. DA-01 of DA-01 Sheet No. 23 of 31

BY: roaks -

PLOTTED: 9/15/2021
FILE: \\bakerv05\w2017\2017\117040_HARCO\Task_001_Woodland Run\CADD\plans\23_gDA-001-Woodland.dgn

HCG BILLING ID NO. :
TAX MAP: 0049
GRID: 0003C
ADC MAP: 21
GRID: H10

HCG DWG ID NO. :
SCALE: 1" = 200'

BY: roaks -

SEQUENCE OF CONSTRUCTION

1. THE CONTRACTOR SHALL NOTIFY HARFORD COUNTY DEPARTMENT OF PUBLIC WORKS DPW S/C INSPECTOR AT (410-638-3127 X2434) AT LEAST SEVEN (7) DAYS BEFORE COMMENCING ANY LAND DISTURBING ACTIVITY AND, UNLESS WAIVED, SHALL BE REQUIRED TO HOLD A PRE-CONSTRUCTION MEETING BETWEEN PROJECT REPRESENTATIVES AND A REPRESENTATIVE OF HARFORD COUNTY.
2. LIMIT OF DISTURBANCE, ACCESS ROUTES, AND STAGING AREAS SHALL BE STAKED AND REVIEWED IN THE FIELD WITH THE ENGINEER PRIOR TO CONSTRUCTION TO ALLOW FOR ADJUSTMENTS. ANY ADJUSTMENTS MUST BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.
3. TEMPORARY ORANGE CONSTRUCTION FENCE (TOCF) SHALL BE INSTALLED ALONG THE LIMITS OF DISTURBANCE (LOD) ONLY WHERE THE LOD IS ADJACENT TO ROADWAYS AND PEDESTRIAN TRAFFIC TO PROTECT WETLANDS, WATERWAYS AND ADJACENT PROPERTIES FROM ACCIDENTAL ENCROACHMENT AND IMPACT. APPROVAL BY THE ENGINEER IS REQUIRED IN ORDER TO INSTALL TOCF. INSTALL TOCF IMMEDIATELY AFTER CONSTRUCTION PHASE LOD STAKEOUT AND PRIOR TO THE INSTALLATION OF SEDIMENT AND EROSION CONTROLS.
4. CONTRACTOR TO INSTALL ALL TREE PROTECTION MEASURES PRIOR TO CLEARING AND GRUBBING (TREE PROTECTION FENCE (TPF) AND TREE PROTECTION PLANKING (TPP))) – REFER TO THE EROSION AND SEDIMENT CONTROL PLANS (DWGS. ES-01–ES-04).
5. CLEAR AND GRUB FOR THE AREA REQUIRED FOR INSTALLATION OF THE STABILIZED CONSTRUCTION ENTRANCES (SCE), SILT FENCE (SF), SANDBAG DIVERSION (SD), DIRTY WATER PUMP (DWP), CLEAN WATER PUMP (CWP), OUTFALL PROTECTION (OP), MULCH ACCESS ROAD (MAR), AND PERIMETER CONTROLS. CONTRACTOR TO SALVAGE AND STOCKPILE ALL SALVAGEABLE LOGS AND ROOTWARDS, DURING CLEARING AND GRUBBING. CONTRACTOR TO INSTALL ALL TREE PROTECTION MEASURES PRIOR TO CLEARING AND GRUBBING (TREE PROTECTION PLANKING (TPP))– REFER TO THE EROSION AND SEDIMENT CONTROL PLANS (DWGS. ES-01–ES-04).
6. INSTALL SCE, STAGING AND STOCKPILE AREA, MAR, SF & PERIMETER CONTROLS PRIOR TO ADDITIONAL CLEARING AND GRUBBING.
7. SANDBAG DIVERSION SHALL BE INSTALLED AT THE BEGINING OF EACH WORK DAY ONLY WITHIN THE CONSTRUCTION AREA(S) BEING WORKED AND REMOVED AT THE COMPLETION OF EACH WORK DAY. THE EXACT LOCATIONS MAY BE MODIFIED IN THE FIELD BASED ON EXISTING CONDITIONS. ANY ADJUSTMENTS MUST BE APPROVED BY THE ENGINEER.
8. OUTFALL PROTECTION, DIRTY WATER PUMPS AND CLEAN WATER PUMPS TO BE INSTALLED AT THE BEGINING OF EACH WORK DAY AND REMOVED DAILY. NO IN-STREAM WORK ALLOWED DURING RUNOFF PRODUCING PRECIPITATION EVENTS THAT EXCEEDS PUMPING CAPACITY. THE EXACT LOCATIONS MAY BE MODIFIED IN THE FIELD BASED ON EXISTING CONDITIONS. ANY ADJUSTMENTS MUST BE APPROVED BY THE ENGINEER.
9. THE ACCESS ROAD, STOCKPILE AREAS, OUTFALL PROTECTION AND SANDBAG DIVERSION WILL BE REMOVED AT THE COMPLETION OF EACH CONSTRUCTION PHASE AND IN CONJUNCTION WITH THE FLOODPLAIN GRADING UNLESS OTHERWISE NOTED OR AT THE IN-FIELD DIRECTION OF THE ENGINEER.
10. THE WORK IS DIVIDED INTO SEVEN (7) CONSTRUCTION AREAS AS SHOWN ON THE EROSION AND SEDIMENT CONTROL PLANS.
11. BEGIN WORK IN ACCORDANCE WITH THE INDIVIDUAL SEQUENCES FOR EACH CONSTRUCTION AREA.
12. CONTINGENT SANDY SALVAGED SITE MATERIAL, SALVAGED SOIL AND NATURAL CHANNEL MATERIAL SHALL BE HARVESTED, SALVAGED, AND STOCKPILED DURING THE PHASE IN WHICH IT IS LOCATED ON THE PLANS, UTILIZING AN APPROVED SANDBAG DIVERSION AND DIRTY WATER PUMP PRACTICE.
13. THE ACCESS ROADS, STOCKPILE AREAS, CLEAN WATER PUMPS, OUTFALL PROTECTION, DIRTY WATER PUMPS AND SANDBAG DIVERSIONS WITHIN EACH PHASE SHALL BE REMOVED UPON COMPLETION OF EACH PHASE UNLESS OTHERWISE NOTED OR DIRECTED BY THE ENGINEER. REUSE SANDBAG DIVERSION AT EACH PHASE.
14. UPON COMPLETION OF ALL PHASES INSTALL PERMANENT PLANTINGS PER THE LANDSCAPE SCHEDULE AND PLANS. COMPLETE SAME DAY STABILIZATION FOR ANY DISTURBANCE.
15. UPON APPROVAL OF THE INSPECTOR, REMOVE REMAINING EROSION AND SEDIMENT CONTROL MEASURES AND STABILIZE ANY AREAS DISTURBED BY THEIR REMOVAL.

CONSTRUCTION NOTES

1. BEFORE MATERIAL CAN LEAVE THE SITE, ALL OFF-SITE STOCKPILING MUST BE APPROVED BY THE HARFORD COUNTY SOIL CONSERVATION DISTRICT.
2. WHEN THE SANDBAG DIVERSIONS AND DIRTY WATER PUMPS ARE USED, THE LOCATION OF THE HOSES AND FILTER BAGS MAY BE MODIFIED IN THE FIELD BASED ON EXISTING CONDITIONS.
3. AT THE END OF EACH WORK DAY THE CONTRACTOR SHALL STABILIZE ANY DISTURBED AREA NOT DIRECTED TO AN EROSION AND SEDIMENT CONTROL DEVICE AND AS NOTED NEEDING SAME DAY STABILIZATION.
4. PUMP AROUND PRACTICES, INCLUDING NECESSARY SANDBAGS, SHALL BE IN PLACE AND FUNCTIONAL PRIOR TO BEGINNING INSTREAM ACTIVITIES EACH DAY. AT THE END OF EACH WORK DAY, THE SANDBAG DIVERSION SHALL BE REMOVED TO RE-ESTABLISH BASEFLOW AND PROVIDE A FLOW PATH DURING STORM FLOWS FOR ALL TIMES WHEN THE PUMP AROUND IS NOT ACTIVE.
5. THERE SHALL BE NO HERBICIDE, FERTILIZER, OR LYME TREATMENTS.
6. STOCKPILE SHALL HAVE A MAXIMUM HEIGHT OF 20’ AND A SIDE SLOPE NOT GREATER THAN 2:1. ALL STAGING AND STOCKPILE AREAS HAVE SILT FENCE ON DOWNSTREAM SIDE AS INDICATED ON PLANS.

STREAM CONSTRUCTION AREA 1:
DWG. ES-01

1. INSTALL STABILIZED CONSTRUCTION ENTRANCE, TEMPORARY ORANGE CONSTRUCTION FENCE, MULCH ACCESS ROAD, TREE PROTECTION PLANKING, SILT FENCE AND STAGING AND STOCKPILE AREA AS INDICATED ON PLANS. CONTRACTOR MAY PLACE TEMPORARY GRADING FOR COMPLETION OF ACCESS ROAD WITHIN THE LOD.
2. INSTALL SANDBAG DIVERSION (SB-1, SB-2), CLEAN WATER PUMP (CWP-1), DIRTY WATER PUMP (DW-1), FILTER BAG (FB-1), DIVERSION HOSE, AND OUTFALL PROTECTION (OP-1). SEE DWG. ES-01 FOR APPROXIMATE LOCATIONS. CONTRACTOR TO HAND PLACE SB-1 AND SB-2.
3. PRIOR TO ANY INSTREAM OR BANK WORK, PUMP AROUND THE WORK AREA BEHIND UPSTREAM SANDBAG DIVERSION USING CLEAN WATER PUMP AND DEWATER ANY SITTING WATER BETWEEN THE TWO SANDBAG DIVERSIONS USING DIRTY WATER PUMP AND FILTER BAG (SEE CONSTRUCTION NOTE 5).

4. COMPLETE STREAMWORK WORKING FROM DOWNSTREAM TO UPSTREAM. DO NOT DISTURB MORE THAN CAN BE BROUGHT TO FINISHED GRADE AND STABILIZED IN A DAY.
5. PLACE PERMANENT AND TEMPORARY SEED AS INDICATED PRIOR TO THE PLACEMENT OF ANY STABILIZATION MATTING OR MULCH.
6. PERMANENTLY STABILIZE THE WORK AREA WITH TYPE D SOIL STABILIZATION MATTING AND TEMPORARY MULCH AS SHOWN ON PLANS. TEMPORARILY STABILIZE STREAM CHANNEL WITH ROCK AT THE END OF EACH DAY. CONTRACTOR TO PLACE STRAW MULCH UNDER TEMPORARY MATTING AND ALL NON STREAMBED DISTURBED AREAS.
7. CONSTRUCTION TO BE COORDINATED SO THAT ANY BANK GRADING IN THE ACCESS ROAD LOCATION IS COMPLETED CONCURRENT WITH THE REMOVAL OF ACCESS ROAD WITHIN CONSTRUCTION AREA 1.
8. AFTER CONSTRUCTION IS COMPLETE AND AREAS HAVE BEEN STABILIZED, REMOVE EROSION AND SEDIMENT CONTROLS WITH THE APPROVAL OF THE HARFORD COUNTY SCD INSPECTOR AND STABILIZE THE AREAS THAT ARE DISTURBED BY REMOVAL OF SEDIMENT CONTROLS.

STREAM CONSTRUCTION AREA 2:

STREAM BASELINE STA. 0+00 TO STA. 2+85 (DWG. ES-02)

1. TEMPORARY ORANGE CONSTRUCTION FENCE AND TREE PROTECTION PLANKING, AS INDICATED ON PLANS.
2. INSTALL SANDBAG DIVERSION (SB-3, SB-4), CLEAN WATER PUMP (CWP-2), DIRTY WATER PUMP (DW-2), FILTER BAG (FB-2), DIVERSION HOSE, AND OUTFALL PROTECTION (OP-2). SEE DWG. ES-02 FOR APPROXIMATE LOCATIONS. CONTRACTOR TO HAND PLACE SB-3 AND SB-4.
3. PRIOR TO ANY INSTREAM OR BANK WORK, PUMP AROUND THE WORK AREA BEHIND UPSTREAM SANDBAG DIVERSION USING CLEAN WATER PUMP AND DEWATER ANY SITTING WATER BETWEEN THE TWO SANDBAG DIVERSIONS USING DIRTY WATER PUMP AND FILTER BAG (SEE CONSTRUCTION NOTE 4).
4. COMPLETE STREAMWORK FROM STA. 0+00 TO STA. 2+85 (STREAM BASELINE) WORKING FROM UPSTREAM TO DOWNSTREAM. DO NOT DISTURB MORE THAN CAN BE BROUGHT TO FINISHED GRADE AND STABILIZED IN A DAY.
5. PLACE PERMANENT AND TEMPORARY SEED AS INDICATED PRIOR TO THE PLACEMENT OF ANY STABILIZATION MATTING OR MULCH.
6. PERMANENTLY STABILIZE THE WORK AREA WITH TYPE D SOIL STABILIZATION MATTING AND TEMPORARY MULCH AS SHOWN ON PLANS. TEMPORARILY STABILIZE STREAM CHANNEL WITH ROCK AT THE END OF EACH DAY. CONTRACTOR TO PLACE STRAW MULCH UNDER TEMPORARY MATTING AND ALL NON STREAMBED DISTURBED AREAS.
7. AFTER CONSTRUCTION IS COMPLETE AND AREAS HAVE BEEN STABILIZED, REMOVE EROSION AND SEDIMENT CONTROLS WITH THE APPROVAL OF THE HARFORD COUNTY SCD INSPECTOR AND STABILIZE THE AREAS THAT ARE DISTURBED BY REMOVAL OF SEDIMENT CONTROLS.

STREAM CONSTRUCTION AREA 3:

STREAM BASELINE STA. 2+85 TO STA. 4+55 (DWG. ES-02)

1. INSTALL STABILIZED CONSTRUCTION ENTRANCE, TEMPORARY ORANGE CONSTRUCTION FENCE, MULCH ACCESS ROAD, TREE PROTECTION PLANKING, SILT FENCE AND STAGING AND STOCKPILE AREA AS INDICATED ON PLANS. CONTRACTOR MAY PLACE TEMPORARY GRADING FOR COMPLETION OF ACCESS ROAD WITHIN THE LOD.
2. INSTALL SANDBAG DIVERSION (SB-5), CLEAN WATER PUMP (CWP-3), DIRTY WATER PUMP (DW-3), FILTER BAG (FB-3), DIVERSION HOSE, AND OUTFALL PROTECTION (OP-3). SEE DWG. ES-02 FOR APPROXIMATE LOCATIONS. CONTRACTOR TO HAND PLACE SB-5.
3. PRIOR TO ANY INSTREAM OR BANK WORK, PUMP AROUND THE WORK AREA BEHIND UPSTREAM SANDBAG DIVERSION USING CLEAN WATER PUMP AND DEWATER ANY SITTING WATER BETWEEN THE TWO SANDBAG DIVERSIONS USING DIRTY WATER PUMP AND FILTER BAG (SEE CONSTRUCTION NOTE 4).
4. COMPLETE STREAMWORK FROM STA 2+85 TO STA. 4+55 WORKING FROM UPSTREAM TO DOWNSTREAM. DO NOT DISTURB MORE THAN CAN BE BROUGHT TO FINISHED GRADE AND STABILIZED IN A DAY.
5. PLACE PERMANENT AND TEMPORARY SEED AS INDICATED PRIOR TO THE PLACEMENT OF ANY STABILIZATION MATTING OR MULCH.
6. PERMANENTLY STABILIZE THE WORK AREA WITH TYPE D SOIL STABILIZATION MATTING AND TEMPORARY MULCH AS SHOWN ON PLANS. TEMPORARILY STABILIZE STREAM CHANNEL WITH ROCK AT THE END OF EACH DAY. CONTRACTOR TO PLACE STRAW MULCH UNDER TEMPORARY MATTING AND ALL NON STREAMBED DISTURBED AREAS.
7. AFTER CONSTRUCTION IS COMPLETE AND AREAS HAVE BEEN STABILIZED, REMOVE EROSION AND SEDIMENT CONTROLS WITH THE APPROVAL OF THE HARFORD COUNTY SCD INSPECTOR AND STABILIZE THE AREAS THAT ARE DISTURBED BY REMOVAL OF SEDIMENT CONTROLS.

STREAM CONSTRUCTION AREA 4:

STREAM BASELINE STA. 4+55 TO STA. 7+05 (DWG. ES-02 AND DWG. ES-03)

1. INSTALL TEMPORARY ORANGE CONSTRUCTION FENCE AND TREE PROTECTION PLANKING, AS INDICATED ON PLANS.
2. INSTALL SANDBAG DIVERSION (SB-6), CLEAN WATER PUMP (CWP-4), DIRTY WATER PUMP (DW-4), FILTER BAG (FB-4), DIVERSION HOSE, AND OUTFALL PROTECTION (OP-4). SEE DWG. ES-02 AND ES-03 FOR APPROXIMATE LOCATIONS. CONTRACTOR TO HAND PLACE SB-6.

3. PRIOR TO ANY INSTREAM OR BANK WORK, PUMP AROUND THE WORK AREA BEHIND UPSTREAM SANDBAG DIVERSION USING CLEAN WATER PUMP AND DEWATER ANY SITTING WATER BETWEEN THE TWO SANDBAG DIVERSIONS USING DIRTY WATER PUMP AND FILTER BAG (SEE CONSTRUCTION NOTE 4).
4. COMPLETE STREAMWORK FROM STA 4+55 TO STA. 7+05 WORKING FROM DOWNSTREAM TO UPSTREAM. DO NOT DISTURB MORE THAN CAN BE BROUGHT TO FINISHED GRADE AND STABILIZED IN A DAY.
5. PLACE PERMANENT AND TEMPORARY SEED AS INDICATED PRIOR TO THE PLACEMENT OF ANY STABILIZATION MATTING OR MULCH.
6. PERMANENTLY STABILIZE THE WORK AREA WITH TYPE D SOIL STABILIZATION MATTING AND TEMPORARY MULCH AS SHOWN ON PLANS. TEMPORARILY STABILIZE STREAM CHANNEL WITH ROCK AT THE END OF EACH DAY. CONTRACTOR TO PLACE STRAW MULCH UNDER TEMPORARY MATTING AND ALL NON STREAMBED DISTURBED AREAS.
7. AFTER CONSTRUCTION IS COMPLETE AND AREAS HAVE BEEN STABILIZED, REMOVE EROSION AND SEDIMENT CONTROLS WITH THE APPROVAL OF THE HARFORD COUNTY SCD INSPECTOR AND STABILIZE THE AREAS THAT ARE DISTURBED BY REMOVAL OF SEDIMENT CONTROLS.

STREAM CONSTRUCTION AREA 5:

STREAM BASELINE STA. 7+05 TO STA. 11+70 (DWG. ES-03)

1. INSTALL TEMPORARY ORANGE CONSTRUCTION FENCE AND TREE PROTECTION PLANKING, FENCE AS INDICATED ON PLANS.
2. INSTALL SANDBAG DIVERSION (SB-7), CLEAN WATER PUMP (CWP-5), DIRTY WATER PUMP (DW-5), FILTER BAG (FB-5), DIVERSION HOSE, AND OUTFALL PROTECTION (OP-5). SEE DWG. ES-03 FOR APPROXIMATE LOCATIONS. CONTRACTOR TO HAND PLACE SB-7.
3. PRIOR TO ANY INSTREAM OR BANK WORK, PUMP AROUND THE WORK AREA BEHIND UPSTREAM SANDBAG DIVERSION USING CLEAN WATER PUMP AND DEWATER ANY SITTING WATER BETWEEN THE TWO SANDBAG DIVERSIONS USING DIRTY WATER PUMP AND FILTER BAG (SEE CONSTRUCTION NOTE 4).
4. COMPLETE STREAMWORK FROM STA 7+05 TO STA. 11+70 WORKING FROM UPSTREAM TO DOWNSTREAM. DO NOT DISTURB MORE THAN CAN BE BROUGHT TO FINISHED GRADE AND STABILIZED IN A DAY.
5. PLACE PERMANENT AND TEMPORARY SEED AS INDICATED PRIOR TO THE PLACEMENT OF ANY STABILIZATION MATTING OR MULCH.
6. PERMANENTLY STABILIZE THE WORK AREA WITH TYPE D SOIL STABILIZATION MATTING AND TEMPORARY MULCH AS SHOWN ON PLANS. TEMPORARILY STABILIZE STREAM CHANNEL WITH ROCK AT THE END OF EACH DAY. CONTRACTOR TO PLACE STRAW MULCH UNDER TEMPORARY MATTING AND ALL NON STREAMBED DISTURBED AREAS.
7. AFTER CONSTRUCTION IS COMPLETE AND AREAS HAVE BEEN STABILIZED, REMOVE EROSION AND SEDIMENT CONTROLS WITH THE APPROVAL OF THE HARFORD COUNTY SCD INSPECTOR AND STABILIZE THE AREAS THAT ARE DISTURBED BY REMOVAL OF SEDIMENT CONTROLS.

STREAM CONSTRUCTION AREA 6:

STREAM BASELINE STA. 11+70 TO STA. 15+22 (DWG. ES-03 AND DWG. ES-04)

1. INSTALL STABILIZED CONSTRUCTION ENTRANCE, TEMPORARY ORANGE CONSTRUCTION FENCE, MULCH ACCESS ROAD, TREE PROTECTION PLANKING, SILT FENCE AND STAGING AND STOCKPILE AREA AS INDICATED ON PLANS. CONTRACTOR MAY PLACE TEMPORARY GRADING FOR COMPLETION OF ACCESS ROAD WITHIN THE LOD.
2. INSTALL SANDBAG DIVERSION (SB-8), DIRTY WATER PUMP (DW-6), FILTER BAG (FB-6), DIVERSION HOSE, AND OUTFALL PROTECTION (OP-6). SEE DWG. ES-03 AND ES-04 FOR APPROXIMATE LOCATIONS. CONTRACTOR TO HAND PLACE SB-8.
3. PRIOR TO ANY INSTREAM OR BANK WORK, DEWATER ANY SITTING WATER BETWEEN THE TWO SANDBAG DIVERSIONS USING DIRTY WATER PUMP AND FILTER BAG (SEE CONSTRUCTION NOTE 4).
4. COMPLETE STREAMWORK FROM STA 11+70 TO STA. 15+22 WORKING FROM DOWNSTREAM TO UPSTREAM. DO NOT DISTURB MORE THAN CAN BE BROUGHT TO FINISHED GRADE AND STABILIZED IN A DAY.
5. COMPLETE CURB, INLET, AND RIPRAP OUTFLOW WORK. DO NOT DISTURB MORE THAN CAN BE BROUGHT TO FINISHED GRADE AND STABILIZED IN A DAY.
6. PLACE PERMANENT AND TEMPORARY SEED AS INDICATED PRIOR TO THE PLACEMENT OF ANY STABILIZATION MATTING OR MULCH.
7. PERMANENTLY STABILIZE THE WORK AREA WITH TYPE D SOIL STABILIZATION MATTING AND TEMPORARY MULCH AS SHOWN ON PLANS. TEMPORARILY STABILIZE STREAM CHANNEL WITH ROCK AT THE END OF EACH DAY. CONTRACTOR TO PLACE STRAW MULCH UNDER TEMPORARY MATTING AND ALL NON STREAMBED DISTURBED AREAS.
8. INSTALL PERMANENT PLANTINGS PER THE LANDSCAPE SCHEDULE AND PLANS (SEE DWG. XX) AFTER THE COMPLETION OF ALL PHASES. COMPLETE SAME DAY STABILIZATION FOR ANY DISTURBANCE.
9. CONSTRUCTION TO BE COORDINATED SO THAT ANY BANK GRADING IN THE ACCESS ROAD LOCATION IS COMPLETED CONCURRENT WITH THE REMOVAL OF ACCESS ROAD WITHIN CONSTRUCTION AREA 6.
10. AFTER CONSTRUCTION IS COMPLETE AND AREAS HAVE BEEN STABILIZED, REMOVE EROSION AND SEDIMENT CONTROLS WITH THE APPROVAL OF THE HARFORD COUNTY SCD INSPECTOR AND STABILIZE THE AREAS THAT ARE DISTURBED BY REMOVAL OF SEDIMENT CONTROLS.



P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

BILLING NO. XXXXXX
EG-SWMENG- XXXXXX-XXXX #XXXX
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

SIGN AND SEAL

Revisions

HARFORD COUNTY, MARYLAND

WOODLAND RUN STREAM RESTORATION

SEQUENCE OF CONSTRUCTION

Drawn By : <u> RMO/BEA </u>	Scale : <u> NOT TO SCALE </u>
Designed By : <u> RMO/BEA </u>	Date : <u> AUGUST 2021 </u>
Reviewed By : <u> DMH </u>	Contract No.: <u> XX-XXXX </u>
Drawing No. <u> SC-01 </u> of <u> SC-01 </u>	Sheet No. <u> 24 </u> of <u> 31 </u>

BY: roaks -

SITE ANALYSIS (NOT FOR BIDDING PURPOSES)

TOTAL AREA TO BE STABILIZED = 2.77 AC
 TOTAL DISTURBED AREA = 2.77 AC
 TOTAL AREA TO BE PAVED = 0 AC
 TOTAL CUT = 4570.87 CU YD
 TOTAL FILL = 1371.24 CU YD
 NPDES ID POINT: N: 677615 E: 1500521

ANY SOIL MATERIAL LEAVING THE SITE SHALL ONLY
 BE DISPOSED OF AT SITES WITH AN APPROVED
 EROSION AND SEDIMENT CONTROL PLAN AND AN
 ACTIVE GRADING PERMIT

NOT FOR
 CONSTRUCTION



P: 410.728.2900
 700 East Pratt Street, Suite 500 | Baltimore, MD 21202
 Engineers | Construction Managers | Planners | Scientists
 www.rk&k.com
 Responsive People | Creative Solutions

PROFESSIONAL CERTIFICATION
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME,
 AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF
 THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

PERMANENT VEGETATIVE STABILIZATION

ALL DISTURBED AREAS WHICH ARE NOT BE PAVED, SHALL BE
 PERMANENTLY STABILIZED AS FOLLOWS:

- A). SEEDBED PREPARATION:
 LOOSEN UPPER THREE INCH BY RAKING,DISCING, OR OTHER
 ACCEPTABLE MEANS AFTER SPREADING FOUR INCHES OF TOP SOIL.
- B). SOIL AMENDMENTS:
 APPLY 500 LBS. PER ACRE OF 10-10-10 FERTILIZER AND TWO TONS
 PER ACRE OF LIME.
- C). SEEDING:*
 FOR PERIODS MARCH1 TO MAY 15 AND AUGUST 15 TO OCTOBER 15,
 SEED WITH 125LBS. PER ACRE OF TALL FESCUE, 15 LBS. PER ACRE OF
 PERENNIAL RYEGRASS, AND 10 LBS. OF KENTUCKY BLUEGRASS.

 FOR PERIOD OF MARCH 16 TO AUGUST 14, SEED WITH 110 LBS. PER ACRE
 OF TALL FESCUE AND 3 LBS. PER ACRE OF WEEPING LOVEGRASS.

 FOR PERIOD OF OCTOBER 16 TO FEBRUARY 28, PROTECT SITE BY:
 OPTIONS (1) 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH
 AND SEED AS SOON AS POSSIBLE IN THE SPRING, (2) USE SOD OR
 (3) SEED WITH 100 LBS. PER ACRE OF TALL FESCUE AND MULCH WITH
 2 TONS PER ACRE OF WELL ANCHORED STRAW.
 NOTE: FOR QUICK COVER WITH TALL FESCUE, ADD 2 LBS. OF SMALL
 GRAIN PER 1,000 SQ.FT.
- D). MULCHING SPECIFICATIONS
 MULCH SHALL BE APPLIED TO ALL SEEDED AREAS IMMEDIATELY AFTER
 SEEDING.

 APPLY 2 TONS PER ACRE OF STRAW OVER ALL SEEDED AREAS. IF A
 MULCH ANCHORING TOOL IS TO BE USED, THE RATE SHALL BE INCREASED
 TO 2.5 TONS PER ACRE.**

 MULCH ANCHORING SHALL BE PERFORMED IMMEDIATELY FOLLOWING
 MUCH APPLICATION TO MINIMIZE LOSS BY WIND AND WATER. THE TYPE
 OF MULCH ANCHORING MUST COMPLY WITH THE 1994 MARYLAND
 STANDARDS AND SPECIFICATIONS.

* IF OTHER SEED MIXES ARE TO BE SUBSTITUTED, THEY MUST COMPLY WITH THE
 1994 MARYLAND STANDARDS AND SPECIFICATIONS, CHAPTER 20, TABLE 25.
 ** IF A DIFFERENT TYPE OF MULCH IS TO BE USED, IT MUST COMPLY WITH THE
 1994 MARYLAND STANDARDS AND SPECIFICATIONS, CHAPTER 20.

TEMPORARY VEGETATION STABILIZATION

- A). SEEDBED PREPARATION:
 LOOSEN UPPER THREE INCHES BY DISCING, RAKING OR OTHER
 ACCEPTABLE MEANS.
- B). SOIL AMENDMENTS:
 APPLY 600 LBS. PER ACRE OF 10-10-10 FERTILIZER AND TWO TONS
 PER ACRE OF LIME.
- C). SEEDING:
 FOR PERIOD OF MARCH 11 TO APRIL 30 AND AUGUST 15 TO
 NOVEMBER 15, SEED WITH 2.5 BU PER ACRE OF CEREAL RYE
 PLUS 30 LBS. PER ACRE OF TALL FESCUE OR 5 LBS. PER ACRE
 OF REDTOP OR 20 LBS. PER ACRE OF PERENNIAL RYEGRASS.

 FOR PERIODS OF MAY1 TO AUGUST 14, SEED WITH 3 LBS. PER ACRE
 OF WEEPING LOVEGRASS OR 40 LBS. PER ACRE OF JAPANESE OR
 FOXTAIL MILLET.

 FOR PERIODS OF NOVEMBER 16 TO FEBRUARY 28, PROTECT THE SITE
 BY APPLYING TWO TONS PER ACRE OF WELL ANCHORED STRAW MULCH
 AND SEED AS SOON AS POSSIBLE IN THE SPRING, OR USE SOD.
- D). MULCHING SPECIFICATIONS:
 MULCH SHALL BE APPLIED TO ALL SEEDED AREAS. IMMEDIATELY AFTER
 SEEDING.
 APPLY TWO TONS PER ACREA OF STRAW OVER ALL SEEDED AREAS. IF A
 MULCH ANCHORING TOOL IS TO BE USED, THE RATE SHALL BE INCREASED
 TO 25 TONS PER ACRE.**
 MULCH ANCHORING SHALL BE PERFORMED IMMEDIATELY FOLLOWING MULCH
 APPLICATION TO MINIMIZE LOSS BY WIND AND AETER. THE MULCH ANCHORING
 TOOL MUST COMPLY WITH THE 1994 MARYLAND STANDARDS SPECIFICATIONS.

* IF OTHER SEED MIXES ARE TO BE SUBSTITUTED, THEY MUST COMPLY WITH THE 1994
 MARYLAND STANDARDS AND SPECIFICATIONS, CHAPTER 20, TABLE 25
 ** IF A DIFFERENT TYPE OF MULCH IS TO BE USED, IT MUST COMPLY WITH THE 1994
 MAYLAND STANDARDS AND SPECIFICATIONS, CHAPTER 20.

BEST MANAGEMENT PRACTICES FOR WORKING IN
 NON TIDAL WETLANDS, WETLAND BUFFERS,
 WATERWAYS AND 100 YEAR FLOOD PLAINS

1. NO EXCESS FILL, CONSTRUCTION MATERIAL, OR DEBRIS SHALL BE STOCKPILED OR STORED
 IN NON TIDAL WETLANDS, NON TIDAL WETLAND BUFFERS, WATERWAYS OR THE 100-YEAR
 FLOODPLAIN.
2. PLACE MATERIALS IN A LOCATION AND MANNER WHICH DOES NOT ADVERSELY IMPACT SURFACE
 OR SUBSURFACE WATER FLOW INTO OR OUT OF NON TIDAL WETLANDS, NON TIDAL WETLAND
 BUFFERS, WATERWAYS OR THE 100 YEAR FLOODPLAIN.
3. DO NOT USE EXCAVATED MATERIAL AS BACK FILL IF IT CONTAINS WASTE METAL PRODUCTS,
 UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE. IF ADDITIONAL
 BACK FILL IS REQUIRED, USE CLEAN MATERIAL FREE OF WASTE METAL PRODUCTS, UNSIGHTLY
 DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE.
4. PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE
 TO NON TIDAL WETLANDS, NON TIDAL WETLAND BUFFERS, OR WATRWAYS OR THE 100 YEAR
 FLOODPLAIN.
5. REPAIR AND MAINTAIN ANY SERVICEABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT LOSS
 OF NON TIDAL WETLANDS, NON TIDAL WETLAND BUFFERS, OR WATERWAYS, OR PERMANENT
 MODIFICATION OF THE 100 YEAR FLOODPLAIN IN EXCESS OF THAT LOST UNDER THE ORIGINALLY
 AUTHORIZED STRUCTURE OR FILL.
6. RECTIFY ANY NON TIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS OR 100 YEAR FLOODPLAIN
 TEMPORARILY IMPACTED BY ANY CONSTRUCTION.
7. ALL STABILIZATION IN THE NON TIDAL WETLAND AND NON TIDAL WETLAND BUFFER SHALL
 CONSIST OF THE FOLLOWING SPECIES: ANNUAL RYEGRASS(LOLIUM MULTIFLORUM),
 MILLET(SETRA ITALICA), BARLEY(HORDEUM SP.), OATS(UNIDLA SP), AND/OR RYE(SECALE
 CEREALE). THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO
 ALLOWING FOR THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES. OTHER NON
 PERSISTENT VEGETATION MAY BE ACCEPTABLE, BUT MUST BE APPROVED BY THE NON TIDAL
 WETLANDS AND WATERWAYS DIVISION. KENTUCKY 31 FESCUE SHALL NOT BE UTILIZED IN
 WETLAND OR BUFFER AREAS. THE AREA SHOULD BE SEEDED AND MULCHED TO REDUCE EROSION.
8. AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED, AFTER INSTALLATION HAS BEEN
 COMPLETED, MAKE POST CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL
 GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
9. TO PROTECT AQUATIC SPECIES, IN STREAM WORK IS PROHIBITED AS DETERMINED BY THE
 CLASSIFICATION OF THE STREAM:
 9.1. USE 1 WATERS: IN STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD
 MARCH 1 THRU JUNE 15, INCLUSIVE, DURING ANY YEAR.
10. STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE
 WASHING OF DEBRIS INTO THE WATERWAY.
11. CULVERTS SHALL BE CONSTRUCTED AND ANY RIPRAP PLACED SO AS NOT TO OBSTRUCT THE
 MOVEMENT OF AQUATIC SPECIES, UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPONDU
 WATER.

DEVELOPER'S/LANDOWNER'S CERTIFICATION

I/WE CERTIFY THAT ALL PROPOSED WORK SHOWN ON THESE CONSTRUCTION DRAWING(S) WILL BE
 ACCOMPLISHED PURSUANT TO THESE PLANS. I/WE ALSO UNDERSTAND THAT IT IS MY/OUR
 RESPONSIBILITY TO HAVE THE CONSTRUCTION SUPERVISED AND CERTIFIED, INCLUDING THE
 SUBMITTAL OF "AS-BUILT" PLANS WITHIN 30 DAYS OF COMPLETION, BY A REGISTERED PROFESSIONAL
 ENGINEER.

SIGNED _____ DATE _____
 PRINTED NAME _____

ENGINEER'S CERTIFICATION

I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL
 AND STORM WATER MANAGEMENT REPRESENTS A PRACTICAL AND
 WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE
 CONDITIONS AND THAT IT WAS PREPARED WITH THE 2011 MARYLAND
 STANDARD AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT
 CONTROL

ENGINEER _____ DATE _____

EROSION AND SEDIMENT CONTROL
 PLAN # _____

RECOMMEND FOR APPROVAL

 HARFORD COUNTY DPW

TECHNICAL CONCURRENCE

 HARFORD SOIL CONSERVATION DISTRICT

APPROVED:

 HARFORD SOIL CONSERVATION DISTRICT

HARFORD COUNTY, MARYLAND

WOODLAND RUN
 STREAM RESTORATION
 EROSION AND SEDIMENT CONTROL NOTES

Drawn By : _____ RMO/BEA
 Designed By : _____ RMO/BEA
 Reviewed By : _____ DMH
 Scale : _____ NOT TO SCALE
 Date : _____ AUGUST 2021
 Contract No.: _____ XX-XXXX

Drawing No. EN-01 of EN-02 Sheet No. 25 of 31

ADC MAP: 21 GRID: H10

TAX MAP: 0049 GRID: 0003C

HCG BILLING ID No.:

HCG DWG ID No.:

SCALE: 1"=100'

B-4-2 STANDARDS AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

DEFINITION

THE PROCESS OF PREPARING THE SOILS TO SUSTAIN ADEQUATE VEGETATIVE STABILIZATION.

PURPOSE

TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH.

CONDITIONS WHERE PRACTICE APPLIES

WHERE VEGETATIVE STABILIZATION IS TO BE ESTABLISHED.

CRITERIA

A. SOIL PREPARATION

1. TEMPORARY STABILIZATION

- A. SEEDBED PREPARATION CONSISTS OF LOOSENING SOIL TO A DEPTH OF 3 TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT, SUCH AS DISC HARROWS OR CHISEL PLOWS OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT. AFTER THE SOIL IS LOOSENEED, IT MUST NOT BE ROLLED OR DRAGGED SMOOTH BUT LEFT IN THE ROUGHENED CONDITION. SLOPES 3:1 OR FLATTER ARE TO BE TRACKED WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE.
 - B. APPLY FERTILIZER AND LIME AS PRESCRIBED ON THE PLANS.
 - C. INCORPORATE LIME AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
2. PERMANENT STABILIZATION
- A. A SOIL TEST IS REQUIRED FOR ANY EARTH DISTURBANCE OF 5 ACRES OR MORE. THE MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT ARE:
 - I. SOIL PH BETWEEN 6.0 AND 7.0.
 - II. SOLUBLE SALTS LESS THAN 500 PARTS PER MILLION (PPM).
 - III. SOIL CONTAINS LESS THAN 40 PERCENT CLAY BUT ENOUGH FINE GRAINED MATERIAL (GREATER THAN 30 PERCENT SILT PLUS CLAY) TO PROVIDE THE CAPACITY TO HOLD A MODERATE AMOUNT OF MOISTURE. AN EXCEPTION: IF LOVEGRASS WILL BE PLANTED, THEN A SANDY SOIL (LESS THAN 30 PERCENT SILT PLUS CLAY) WOULD BE ACCEPTABLE.
 - IV. SOIL CONTAINS 1.5 PERCENT MINIMUM ORGANIC MATTER BY WEIGHT.
 - V. SOIL CONTAINS SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.
 - B. APPLICATION OF AMENDMENTS OR TOPSOIL IS REQUIRED IF ON-SITE SOILS DO NOT MEET THE ABOVE CONDITIONS.
 - C. GRADED AREAS MUST BE MAINTAINED IN A TRUE AND EVEN GRADE AS SPECIFIED ON THE APPROVED PLAN, THEN SCARIFIED OR OTHERWISE LOOSENEED TO A DEPTH OF 3 TO 5 INCHES.
 - D. APPLY SOIL AMENDMENTS AS SPECIFIED ON THE APPROVED PLAN OR AS INDICATED BY THE RESULTS OF A SOIL TEST.
 - E. MIX SOIL AMENDMENTS INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS. RAKE LAWN AREAS TO SMOOTH THE SURFACE, REMOVE LARGE OBJECTS LIKE STONES AND BRANCHES, AND READY THE AREA FOR SEED APPLICATION. LOOSEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT TO ROUGHEN THE SURFACE WHERE SITE CONDITIONS WILL NOT PERMIT NORMAL SEEDBED PREPARATION. TRACK SLOPES 3:1 OR FLATTER WITH TRACKED EQUIPMENT LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. LEAVE THE TOP 1 TO 3 INCHES OF SOIL LOOSE AND FRIABLE. SEEDBED LOOSENING MAY BE UNNECESSARY ON NEWLY DISTURBED AREAS.

B. TOPSOILING

1. TOPSOIL IS PLACED OVER PREPARED SUBSOIL PRIOR TO ESTABLISHMENT OF PERMANENT VEGETATION. THE PURPOSE IS TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH. SOILS OF CONCERN HAVE LOW MOISTURE CONTENT, LOW NUTRIENT LEVELS, LOW PH, MATERIALS TOXIC TO PLANTS, AND/OR UNACCEPTABLE SOIL GRADATION.
2. TOPSOIL SALVAGED FROM AN EXISTING SITE MAY BE USED PROVIDED IT MEETS THE STANDARDS AS SET FORTH IN THESE SPECIFICATIONS. TYPICALLY, THE DEPTH OF TOPSOIL TO BE SALVAGED FOR A GIVEN SOIL TYPE CAN BE FOUND IN THE REPRESENTATIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USDA-NRCS.
3. TOPSOILING IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES WHERE:
 - A. THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH.
 - B. THE SOIL MATERIAL IS SO SHALLOW THAT THE ROOTING ZONE IS NOT DEEP ENOUGH TO SUPPORT PLANTS OR FURNISH CONTINUING SUPPLIES OF MOISTURE AND PLANT NUTRIENTS.
 - C. THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH.
 - D. THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE.
4. AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN.
5. TOPSOIL SPECIFICATIONS: SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING CRITERIA:
 - A. TOPSOIL MUST BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, OR LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. TOPSOIL MUST NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND MUST CONTAIN LESS THAN 5 PERCENT BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1.5 INCHES IN DIAMETER.
 - B. TOPSOIL MUST BE FREE OF NOXIOUS PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, NUT SEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.
 - C. TOPSOIL SUBSTITUTES OR AMENDMENTS, AS RECOMMENDED BY A QUALIFIED AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY, MAY BE USED IN LIEU OF NATURAL TOPSOIL.
6. TOPSOIL APPLICATION
 - A. EROSION AND SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED WHEN APPLYING TOPSOIL.
 - B. UNIFORMLY DISTRIBUTE TOPSOIL IN A 5 TO 8 INCH LAYER AND LIGHTLY COMPACT TO A MINIMUM THICKNESS OF 4 INCHES. SPREADING IS TO BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS MUST BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.
 - C. TOPSOIL MUST NOT BE PLACED IF THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING B.14 AND SEEDBED PREPARATION.

C. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)

1. SOIL TESTS MUST BE PERFORMED TO DETERMINE THE EXACT RATIOS AND APPLICATION RATES FOR BOTH LIME AND FERTILIZER ON SITES HAVING DISTURBED AREAS OF 5 ACRES OR MORE. SOIL ANALYSIS MAY BE PERFORMED BY A RECOGNIZED PRIVATE OR COMMERCIAL LABORATORY. SOIL SAMPLES TAKEN FOR ENGINEERING PURPOSES MAY ALSO BE USED FOR CHEMICAL ANALYSIS.
2. FERTILIZERS MUST BE UNIFORM IN COMPOSITION, FREE FLOWING AND SUITABLE FOR ACCURATE APPLICATION BY APPROPRIATE EQUIPMENT. MANURE MAY BE SUBSTITUTED FOR FERTILIZER WITH PRIOR APPROVAL FROM THE APPROPRIATE APPROVAL AUTHORITY. FERTILIZERS MUST ALL BE DELIVERED TO THE SITE FULLY LABELED ACCORDING TO THE APPLICABLE LAWS AND MUST BEAR THE NAME, TRADE NAME OR TRADEMARK AND WARRANTY OF THE PRODUCER.
3. LIME MATERIALS MUST BE GROUND LIMESTONE (HYDRATED OR BURNT LIME MAY BE SUBSTITUTED EXCEPT WHEN HYDROSEEDING) WHICH CONTAINS AT LEAST 50 PERCENT TOTAL OXIDES (CALCIUM OXIDE PLUS MAGNESIUM OXIDE). LIMESTONE MUST BE GROUND TO SUCH FINENESS THAT AT LEAST 50 PERCENT WILL PASS THROUGH A #100 MESH SIEVE AND 100 PERCENT WILL PASS THROUGH A #20 MESH SIEVE.
4. LIME AND FERTILIZER ARE TO BE EVENLY DISTRIBUTED AND INCORPORATED INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
5. WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, SPREAD GROUND LIMESTONE AT THE RATE OF 4 TO 8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL.

TEMPORARY SEEDING SUMMARY

HARDNESS ZONE (FROM FIGURE B.3): 6B SEED MIXTURE (FROM TABLE B.I)					FERTILIZER RATE (10-20-20)	LIME RATE
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS		
	ANNUAL RYEGRASS	40 LB/ACRE	3/01 - 5/15 8/01 - 10/15	1/2"	436 LB/AC (10 LB/1000 SF)	2 TONS/AC (90 LB/1000 SF)
	FOXTAIL MILLET	30 LB/ACRE	5/16 - 7/31	1/2"		



B-4-3 STANDARDS AND SPECIFICATIONS FOR SEEDING AND MULCHING

DEFINITION

THE APPLICATION OF SEED AND MULCH TO ESTABLISH VEGETATIVE COVER.

PURPOSE

TO PROTECT DISTURBED SOILS FROM EROSION DURING AND AT THE END OF CONSTRUCTION.

CONDITIONS WHERE PRACTICE APPLIES

TO THE SURFACE OF ALL PERIMETER CONTROLS, SLOPES, AND ANY DISTURBED AREA NOT UNDER ACTIVE GRADING.

CRITERIA

A. SEEDING

1. SPECIFICATIONS

- A. ALL SEED MUST MEET THE REQUIREMENTS OF THE MARYLAND STATE SEED LAW. ALL SEED MUST BE SUBJECT TO RE-TESTING BY A RECOGNIZED SEED LABORATORY. ALL SEED USED MUST HAVE BEEN TESTED WITHIN THE 6 MONTHS IMMEDIATELY PRECEDING THE DATE OF SOWING SUCH MATERIAL ON ANY PROJECT. REFER TO TABLE B.4 REGARDING THE QUALITY OF SEED. SEED TAGS MUST BE AVAILABLE UPON REQUEST TO THE INSPECTOR TO VERIFY TYPE OF SEED AND SEEDING RATE.
- B. MULCH ALONE MAY BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES ONLY IF THE GROUND IS FROZEN. THE APPROPRIATE SEEDING MIXTURE MUST BE APPLIED WHEN THE GROUND THAWS.
- C. INOCULANTS: THE INOCULANT FOR TREATING LEGUME SEED IN THE SEED MIXTURES MUST BE A PURE CULTURE OF NITROGEN FIXING BACTERIA PREPARED SPECIFICALLY FOR THE SPECIES. INOCULANTS MUST NOT BE USED LATER THAN THE DATE INDICATED ON THE CONTAINER. ADD FRESH INOCULANTS AS DIRECTED ON THE PACKAGE. USE FOUR TIMES THE RECOMMENDED RATE WHEN HYDROSEEDING. NOTE: IT IS VERY IMPORTANT TO KEEP INOCULANT AS COOL AS POSSIBLE UNTIL USED. TEMPERATURES ABOVE 75 TO 80 DEGREES FAHRENHEIT CAN WEAKEN BACTERIA AND MAKE THE INOCULANT LESS EFFECTIVE.
- D. SOD OR SEED MUST NOT BE PLACED ON SOIL WHICH HAS BEEN TREATED WITH SOIL STERILANTS OR CHEMICALS USED FOR WEED CONTROL UNTIL SUFFICIENT TIME HAS ELAPSED (14 DAYS MIN.) TO PERMIT DISSIPATION OF PHYTO-TOXIC MATERIALS.
2. APPLICATION
 - A. DRY SEEDING: THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST SPREADERS.
 1. INCORPORATE SEED INTO THE SUBSOIL AT THE RATES PRESCRIBED ON TEMPORARY SEEDING TABLE B.1, PERMANENT SEEDING TABLE B.3, OR SITE-SPECIFIC SEEDING SUMMARIES.
 11. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION. ROLL THE SEEDING AREA WITH A WEIGHTED ROLLER TO PROVIDE GOOD SEED TO SOIL CONTACT
 - B. DRILL OR CULTIPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY AND COVER SEED WITH SOIL.
 1. CULTIPACKING SEEDERS ARE REQUIRED TO BURY THE SEED IN SUCH A FASHION AS TO PROVIDE AT LEAST 1/4 INCH OF SOIL COVERING. SEEDBED MUST BE FIRM AFTER PLANTING.
 11. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.
 - C. HYDROSEEDING: APPLY SEED UNIFORMLY WITH HYDROSEEDER (SLURRY INCLUDES SEED AND FERTILIZER).
 1. IF FERTILIZER IS BEING APPLIED AT THE TIME OF SEEDING, THE APPLICATION RATES SHOULD NOT EXCEED THE FOLLOWING: NITROGEN, 100 POUNDS PER ACRE TOTAL OF SOLUBLE NITROGEN; P (PHOSPHOROUS), 200 POUNDS PER ACRE; K (POTASSIUM), 200 POUNDS PER ACRE.
 11. LIME: USE ONLY GROUND AGRICULTURAL LIMESTONE (UP TO 3 TONS PER ACRE MAY BE APPLIED BY HYDROSEEDING). NORMALLY, NOT MORE THAN 2 TONS ARE APPLIED BY HYDROSEEDING AT ANY ONE TIME. DO NOT USE BURNED OR HYDRATED LIME WHEN HYDROSEEDING.
 111. MIX SEED AND FERTILIZER ON SITE AND SEED IMMEDIATELY AND WITHOUT INTERRUPTION.
 - 1V. WHEN HYDROSEEDING DO NOT INCORPORATE SEED INTO THE SOIL.

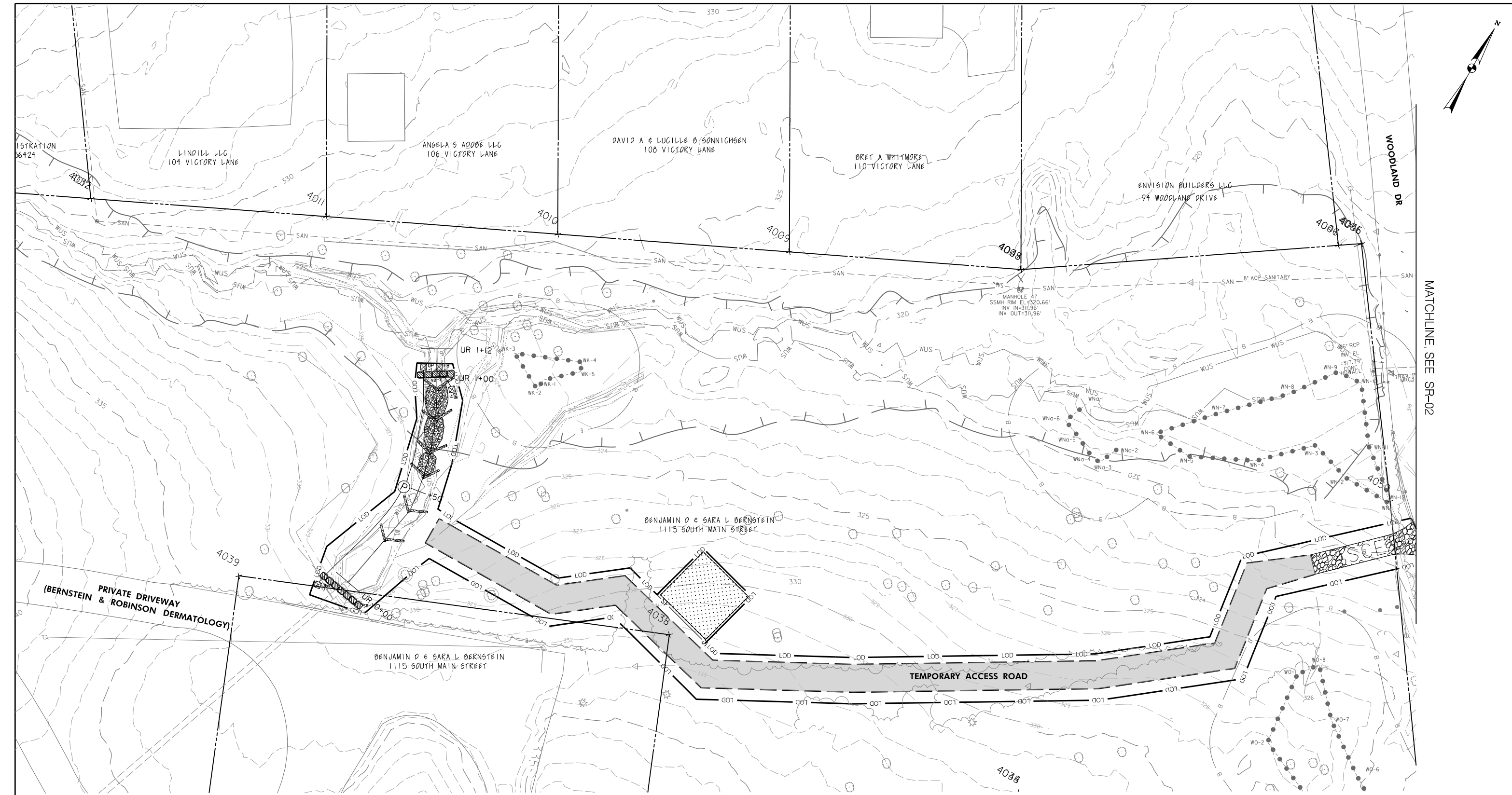
B. MULCHING

1. MULCH MATERIALS (IN ORDER OF PREFERENCE)
 - A. STRAW CONSISTING OF THOROUGHLY THRESHED WHEAT, RYE, OAT, OR BARLEY AND REASONABLY BRIGHT IN COLOR. STRAW IS TO BE FREE OF NOXIOUS WEED SEEDS AS SPECIFIED IN THE MARYLAND SEED LAW AND NOT MUSTY, MOLDY, CAKED, DECAYED, OR EXCESSIVELY DUSTY. NOTE: USE ONLY STERILE STRAW MULCH IN AREAS WHERE ONE SPECIES OF GRASS IS DESIRED.
 - B. WOOD CELLULOSE FIBER MULCH (WCFM) CONSISTING OF SPECIALLY PREPARED WOOD CELLULOSE PROCESSED INTO A UNIFORM FIBROUS PHYSICAL STATE.
 - I. WCFM IS TO BE DYED GREEN OR CONTAIN A GREEN DYE IN THE PACKAGE THAT WILL PROVIDE AN APPROPRIATE COLOR TO FACILITATE VISUAL INSPECTION OF THE UNIFORMLY SPREAD SLURRY.
 - II. WCFM, INCLUDING DYE, MUST CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS.
 - III. WCFM MATERIALS ARE TO BE MANUFACTURED AND PROCESSED IN SUCH A MANNER THAT THE WOOD CELLULOSE FIBER MULCH WILL REMAIN IN UNIFORM SUSPENSION IN WATER UNDER AGITATION AND WILL BLEND WITH SEED, FERTILIZER AND OTHER ADDITIVES TO FORM A HOMOGENEOUS SLURRY. THE MULCH MATERIAL MUST FORM A BLOTTER-LIKE GROUND COVER, ON APPLICATION, HAVING MOISTURE ABSORPTION AND PERCOLATION PROPERTIES AND MUST COVER AND HOLD GRASS SEED IN CONTACT WITH THE SOIL WITHOUT INHIBITING THE GROWTH OF THE GRASS SEEDLINGS.
 - IV. WCFM MATERIAL MUST NOT CONTAIN ELEMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHYTO-TOXIC.
 - V. WCFM MUST CONFORM TO THE FOLLOWING PHYSICAL REQUIREMENTS: FIBER LENGTH OF APPROXIMATELY 10 MILLIMETERS, DIAMETER APPROXIMATELY 1 MILLIMETER, PH RANGE OF 4.0 TO 8.5, ASH CONTENT OF 1.6 PERCENT MAXIMUM AND WATER HOLDING CAPACITY OF 90 PERCENT MINIMUM. CONTACT.
2. APPLICATION
 - A. APPLY MULCH TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING.
 - B. WHEN STRAW MULCH IS USED, SPREAD IT OVER ALL SEEDED AREAS AT THE RATE OF 2 TONS PER ACRE TO A UNIFORM LOOSE DEPTH OF 1 TO 2 INCHES. APPLY MULCH TO ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED. WHEN USING A MULCH ANCHORING TOOL, INCREASE THE APPLICATION RATE TO 2.5 TONS PER ACRE.
 - C. WOOD CELLULOSE FIBER USED AS MULCH MUST BE APPLIED AT A NET DRY WEIGHT OF 1500 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER TO ATTAIN A MIXTURE WITH A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
3. ANCHORING
 - A. PERFORM MULCH ANCHORING IMMEDIATELY FOLLOWING APPLICATION OF MULCH TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY PREFERENCE), DEPENDING UPON THE SIZE OF THE AREA AND EROSION HAZARD:
 - I. A MULCH ANCHORING TOOL IS A TRACTOR DRAWN IMPLEMENT DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE A MINIMUM OF 2 INCHES. THIS PRACTICE IS MOST EFFECTIVE ON LARGE AREAS, BUT IS LIMITED TO FLATTER SLOPES WHERE EQUIPMENT CAN OPERATE SAFELY. IF USED ON SLOPING LAND, THIS PRACTICE SHOULD FOLLOW THE CONTOUR.
 - II. WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. APPLY THE FIBER BINDER AT A NET DRY WEIGHT OF 750 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER AT A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
 - III. SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRO-TACK), DCA-70, PETROSET, TERRA TACK II, TERRA TACK AR OR OTHER APPROVED EQUAL MAY BE USED. FOLLOW APPLICATION RATES AS SPECIFIED BY THE MANUFACTURER. APPLICATION OF LIQUID BINDERS NEEDS TO BE HEAVIER AT THE EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. USE OF ASPHALT BINDERS IS STRICTLY PROHIBITED.
 - IV. LIGHTWEIGHT PLASTIC NETTING MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER RECOMMENDATIONS. NETTING IS USUALLY AVAILABLE IN ROLLS 4 TO 15 FEET WIDE AND 300 TO 3,000 FEET LONG.

PERMANENT SEEDING SUMMARY

HARDINESS ZONE (FROM FIGURE B.3): 6B SEED MIXTURE (FROM TABLE B.3)					FERTILIZER RATE (10-20-20)			LIME RATE
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	N	P205	K20	
1	SWITCH GRASS CREEPING RED FESCUE PATRIDGE PEA	10 15 4	2/15 - 5/31	1/4" - 1/2"	45 LB/AC (1.0 LB/1000 SF)	90 LB/AC (2 LB/1000 SF)	90 LB/AC (2 LB/1000 SF)	2 TONS/AC (90 LB/1000 SF)
8	TALL FESCUE (85%),	100	2/15 - 4/30 8/15 - 11/30					
9	TALL FESCUE KENTUCKY BLUEGRASS PERENNIAL RYEGRASS	60 40 20	2/15 - 4/30 8/15 - 11/30					

S/C PLAN # XXXXX	Revisions	<div style="text-align: center;"> WOODLAND RUN STREAM RESTORATION EROSION AND SEDIMENT CONTROL NOTES </div>	
GP # XXXXX-XXXX			
SIGN AND SEAL			
		Drawn By : _____ RMO/BEA _____ Designed By : _____ RMO/BEA _____ Reviewed By : _____ DMH _____	Scale : _____ NOT TO SCALE _____ Date : _____ AUGUST 2021 _____ Contract No.: _____ XX-XXXX _____
		Drawing No. EN-02 of EN-02	Sheet No. 26 of 31



STANDARD PROPOSED SYMBOLS

- FB FILTER BAG
- OP OUTLET PROTECTION
- DW DIRTY WATER
- WP CLEAN WATER PUMP
- P PUMP
- SAND BAG
- STOCKPILE AREA
- SILT FENCE
- TEMPORARY ACCESS ROAD
- TEMPORARY BRIDGE
- STABILIZED CONSTRUCTION ENTRANCE (SCE)
- TREE PROTECTION PLANKING

NOT FOR CONSTRUCTION

RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists
www.rk.com

Responsive People | Creative Solutions

PROFESSIONAL CERTIFICATION

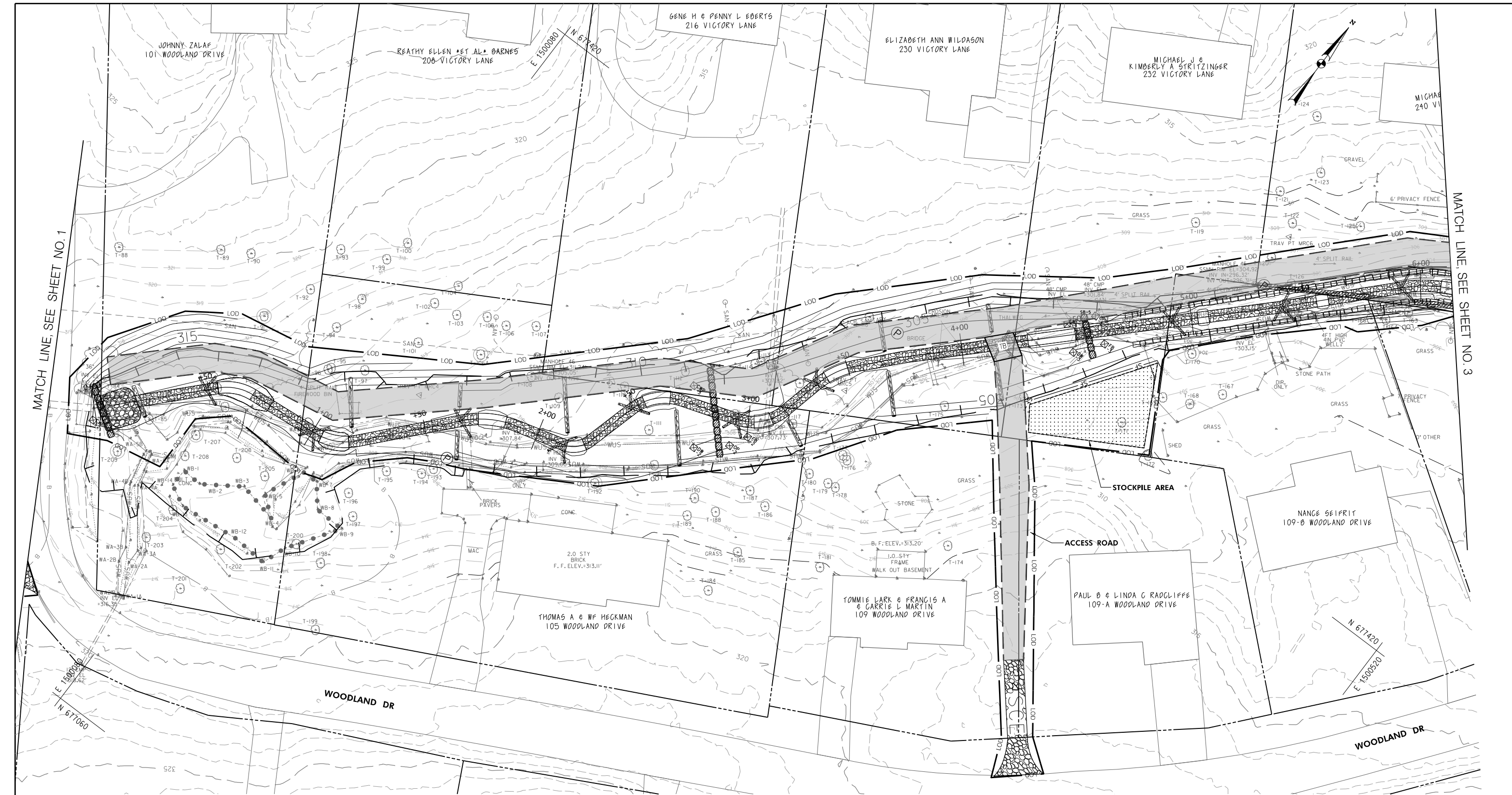
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. XXXXX. EXPIRATION DATE: XX/XX/XXXX.

S/C PLAN # XXXXX	Revisions
GP # XXXXX-XXXX	
SIGN AND SEAL	

HARFORD COUNTY, MARYLAND

WOODLAND RUN STREAM RESTORATION EROSION AND SEDIMENT CONTROL PLANS

Drawn By : RMO/BEA	Scale : 1" = 20'
Designed By : RMO/BEA	Date : AUGUST 2021
Reviewed By : DMH	Contract No. : XX-XXXX
Drawing No. ES-01 of ES-04	Sheet No. 27 of 31



STANDARD PROPOSED SYMBOLS

- FB FILTER BAG
- OP OUTLET PROTECTION
- DW DIRTY WATER
- WP CLEAN WATER PUMP
- PUMP
- SAND BAG
- STOCKPILE AREA
- SILT FENCE
- TEMPORARY ACCESS ROAD
- TEMPORARY ACCESS ROAD
- STABILIZED CONSTRUCTION ENTRANCE (SCE)
- TREE PROTECTION PLANKING

NOT FOR CONSTRUCTION

RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists
www.rk.com

Responsive People | Creative Solutions

PROFESSIONAL CERTIFICATION

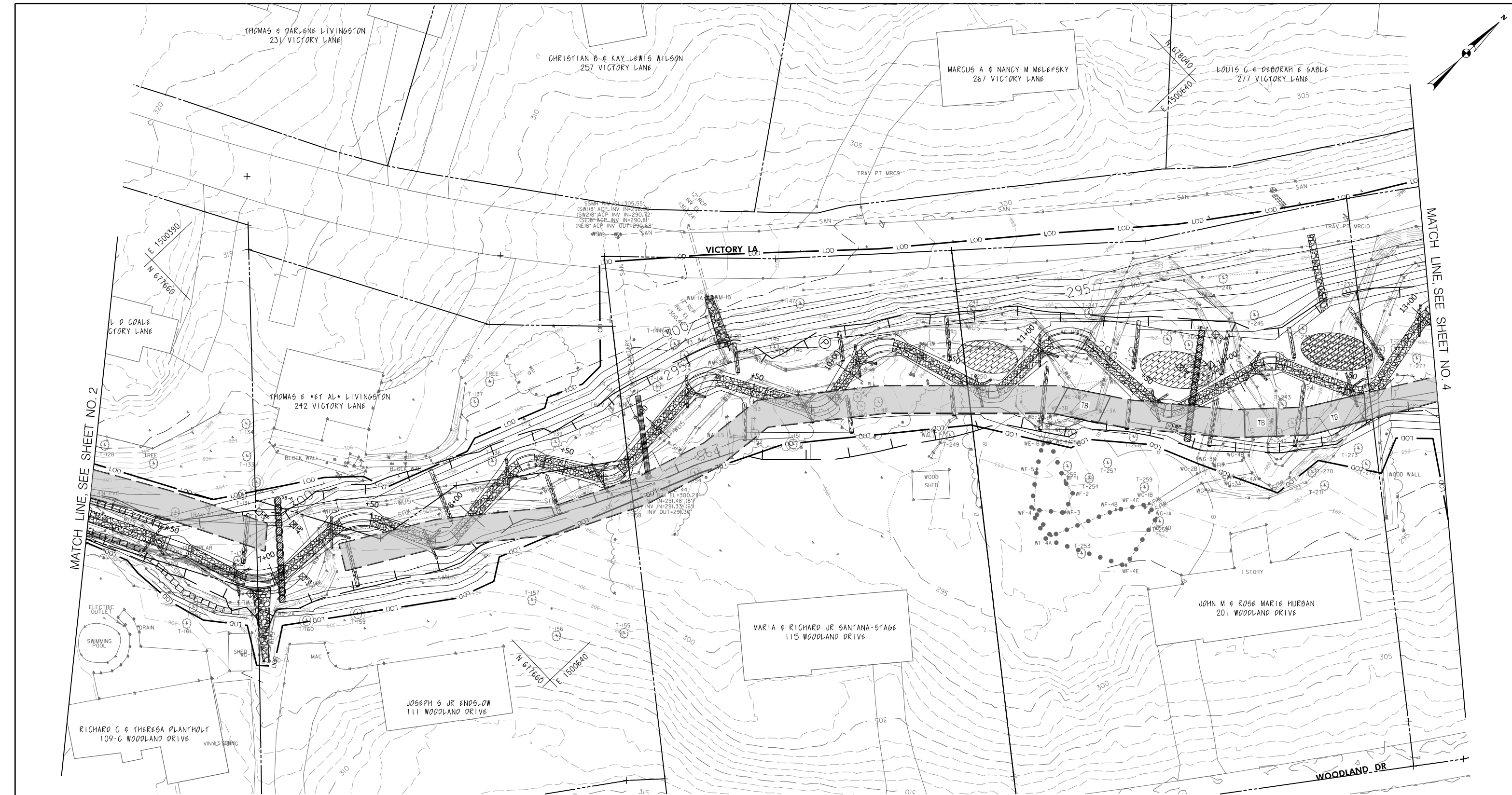
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

S/C PLAN # XXXXX	Revisions
GP # XXXXX-XXXX	
SIGN AND SEAL	

HARFORD COUNTY, MARYLAND

WOODLAND RUN STREAM RESTORATION EROSION AND SEDIMENT CONTROL PLAN

Drawn By : RMO/BEA	Scale : 1" = 20'
Designed By : RMO/BEA	Date : AUGUST 2021
Reviewed By : DMH	Contract No. : XX-XXXX
Drawing No. ES-01 of ES-04	Sheet No. 28 of 31



STANDARD PROPOSED SYMBOLS

- FB FILTER BAG
- OP OUTLET PROTECTION
- DW DIRTY WATER
- WP CLEAN WATER PUMP
- P PUMP
- SAND BAG
- STOCKPILE AREA
- SILT FENCE
- TEMPORARY ACCESS ROAD
- TEMPORARY BRIDGE
- STABILIZED CONSTRUCTION ENTRANCE (SCE)
- TREE PROTECTION PLANKING

NOT FOR CONSTRUCTION

RK&K

P: 410.728.2900
700 East Pratt Street, Suite 500 | Baltimore, MD 21202

Engineers | Construction Managers | Planners | Scientists
www.rk.com

Responsive People | Creative Solutions

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. XXXXX, EXPIRATION DATE: XX/XX/XXXX.

S/C PLAN # XXXXX	Revisions
GP # XXXXX-XXXX	
SIGN AND SEAL	

HARFORD COUNTY, MARYLAND

WOODLAND RUN
STREAM RESTORATION
EROSION AND SEDIMENT CONTROL PLAN

Drawn By : RMO/BEA	Scale : 1" = 20'
Designed By : RMO/BEA	Date : AUGUST 2021
Reviewed By : DMH	Contract No. : XX-XXXX
Drawing No. ES-03 of ES-04	Sheet No. 29 of 31

BY: roaks -

